

This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Industrial permit. The discharge results from the operation of a potable water treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260-00 et seq.

1. Facility Name and Mailing Address: Abel Lake WTP
PO Box 339
Stafford, VA 22555-0339
SIC Code : 4941 WTP

Facility Location: 121 Moorewood Ln
Fredericksburg, VA 22406
County: Stafford

Facility Contact Name: Matt Sauter
Telephone Number: (540) 658-5112

Facility E-mail Address: MSauter@staffordcountyva.gov
2. Permit No.: VA0057487
Expiration Date of previous permit: March 13, 2013

Other VPDES Permits associated with this facility: None

Other Permits associated with this facility: None

E2/E3/E4 Status: Not Applicable
3. Owner Name: Stafford County Board of Supervisors
Owner Contact/Title: Janet Spencer, Asst Director for Operations
Telephone Number: (540) 658-8620
Owner E-mail Address: JSpencer@staffordcountyva.gov
4. Application Complete Date: October 19, 2012
Permit Drafted By: Alison Thompson
Date Drafted: January 8, 2014
Draft Permit Reviewed By: Joan Crowther
Date Reviewed: January 14, 2014
Public Comment Period : Start Date: February 25, 2014
End Date: March 27, 2014
5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name : Abel Lake
Stream Code: 1aXHW

Drainage Area at Outfall: 1.3 mi²
River Mile: 0.13

Stream Basin: Potomac
Subbasin: Potomac

Section: 1c
Stream Class: III

Special Standards: PWS, b
Waterbody ID: VAN-A29L

7Q10 Low Flow: Not Applicable (Lake)
7Q10 High Flow: Not Applicable (Lake)

1Q10 Low Flow: Not Applicable (Lake)
1Q10 High Flow: Not Applicable (Lake)

30Q10 Low Flow: Not Applicable (Lake)
30Q10 High Flow: Not Applicable (Lake)

Harmonic Mean Flow: Not Applicable (Lake)
30Q5 Flow: Not Applicable (Lake)

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

<u> X </u> State Water Control Law	<u> </u> EPA Guidelines
<u> X </u> Clean Water Act	<u> X </u> Water Quality Standards
<u> X </u> VPDES Permit Regulation	<u> X </u> Other (9VAC25-860 Potable WTP GP)
<u> X </u> EPA NPDES Regulation	<u> </u>

7. Licensed Operator Requirements: Not Applicable

8. Reliability Class: Not Applicable

9. Permit Characterization:

<u> </u> Private	<u> </u> Effluent Limited	<u> </u> Possible Interstate Effect
<u> </u> Federal	<u> X </u> Water Quality Limited	<u> </u> Compliance Schedule Required
<u> </u> State	<u> </u> Whole Effluent Toxicity Program Required	<u> </u> Interim Limits in Permit
<u> X </u> WTP	<u> </u> Pretreatment Program Required	<u> </u> Interim Limits in Other Document
<u> </u> TMDL	<u> </u> e-DMR Participant	

10. Wastewater Sources and Treatment Description:

The Abel Lake Water Treatment Plant (WTP) is operated by Stafford County Utilities. The plant is capable of treating six million gallons of water per day, but currently operates at three million gallons per day. The service area in Stafford county includes 12,530 connections serving approximately 38,467 people.

Raw water is drawn from Abel Lake Reservoir with three raw water pumps that can pump up to 6.18 MGD to the plant. The raw water is pretreated with potassium permanganate and polymer in a contact tank prior to being sent to the flash mixer, where alum, polymer, and caustic soda are added prior to flocculation. Seasonally, or as needed, additional polymer is added in the flocculator.

From the flocculation tank, water flows into the clarifier where the solids settle out. Semiannually, the flocculation tank and the clarifier are completely drained and cleaned with all wastewater flowing to the sedimentation lagoons.

Clarifier effluent is chlorinated and then routed down through gravity sand filters. The filter units are backwashed after every 20 to 30 hours of operation or as needed to maintain acceptable product water quality. After filtration, the water is re-chlorinated, then treated with caustic soda, fluoride, and corrosion inhibitor before being sent to a clear well prior to distribution. Chlorinated water from the clear well is used to backwash the filters with the wastewater flowing to the sedimentation lagoon.

Process wastewater from this facility includes the flocculator contents when they are drained semi-annually (usually during the spring and fall), waste solids from the clarifiers, filter backwash water, and flow from sample sink drains and floor drains. The wastewater can be sent to Lagoon A, to Lagoon B, or to both simultaneously. The capacity of the lagoons is 500,000 gallons each. The process wastewater in the lagoons is allowed to settle, is dechlorinated with sodium bisulfite, then the clear supernatant is discharged through Outfall 001 back into Abel Lake. The lagoons are drained and cleaned out twice per year. Solids are removed and disposed of by Synagro.

The facility uses liquid sodium hypochlorite for disinfection of the drinking water and feeds ammonia for THM control. Ammonia is added after the clearwell, but before the water is pumped to the four million gallon storage tank; therefore, ammonia should not be present at Outfall 001.

Stafford County staff has indicated that this facility will be shut down and moth balled once the new Rocky Pen WTP in southern Stafford County (VA0092568) is operational.

See Attachment 2 for the NPDES Permit Rating Worksheet.

See Attachment 3 for a facility schematic/diagram.

TABLE 1 – Outfall Description				
Outfall Number	Discharge Sources	Treatment	Max 30-day Flow	Outfall Latitude and Longitude
001	Backwash from filters, drainage from flocculation tanks, clarifier underdrains, water sent to waste, automatic monitoring	See Item 10 above.	0.189 MGD	38° 23' 19" N 77° 29' 1.9" W
See Attachment 4 for (Stafford Quad, DEQ #182B) topographic map.				

11. Solids Treatment and Disposal Methods:

The lagoons are drained and cleaned out twice per year. Solids are removed and disposed of by Synagro.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2 – Monitoring Stations, Drinking Water Intakes and Point Sources		
Drinking Water Intake (PWS)	Abel Lake/Potomac Creek	Abel Lake Water Treatment Plant raw water intake, ±1,000 feet downstream of Outfall 001
1aPOM013.02	DEQ Ambient Monitoring Station	Abel Lake, 100 feet from the dam.
1aPOM006.72	DEQ Ambient Monitoring Station	Potomac Creek; Route 608 Bridge, Stafford County
VA0073121	Potomac Creek, UT	Richard Schwartz; 0.002 MGD design flow. River mile 1APOM0.02

13. Material Storage:

TABLE 3 – Material Storage

Materials Description	Volume Stored
Caustic Soda/Sodium Hydroxide (25%)	2 - 12,000 gallons
Ferric Sulfate	2 - 6,000 gallons
Potassium Permanganate	8-10 110 lb. drums
Sodium Bisulfite	1 - 500 gallon tank
Magnafloc e-30 Polymer	1-2 55 gallon drums
Fluoride	2-3 Pallets of 50 lb. bags
Corrosion Inhibitor	Pallet of 50 lb. bags
Sodium Hypochlorite	2-5,000 gallon tanks
Ammonia	2-5,000 gallon tanks

14. Site Inspection:

Performed by DEQ Compliance staff on August 8, 2007 (Attachment 5).

15. Receiving Stream Water Quality and Water Quality Standards:**a. Ambient Water Quality Data**

This facility discharges into the southern arm of Abel Lake. The nearest downstream DEQ ambient monitoring station is 1aPOM013.02, located near the dam, approximately 0.34 miles downstream of Outfall 001. The following is the water quality summary for the southern arm of Abel Lake, as taken from the 2012 Integrated Assessment:

No monitoring station exists in this segment, but temperature and dissolved oxygen values from station 1aPOM013.02 are pooled for the entire impoundment.

The aquatic life use is considered fully supporting. The fish consumption, public water supply, recreation, and wildlife uses were not assessed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

Table 4 - Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
<i>Impairment Information in the 2012 Integrated Report</i>							
Potomac Creek	Recreation	<i>E. coli</i>	5.8 miles	No	---	---	2016
	Fish Consumption	PCBs	7.9 miles	Tidal Potomac PCB 10/31/2007	None	NA	---

There is a downstream PCB impairment in the tidal portion of Potomac Creek, which is located approximately 8 miles downstream of this facility. A PCB TMDL has been completed for the Potomac River and was approved by EPA on 10/31/2007. DEQ Staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is a water treatment facility and is highly unlikely to discharge any PCBs.

The planning statement is found in Attachment 6.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Abel Lake, is located within Section 1c of the Potomac River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 7 details other water quality criteria applicable to the receiving stream.

Ammonia:

The fresh water, aquatic life Water Quality Criteria for Ammonia is dependent on the instream temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream. In this case, no dilution is allowed. In cases such as this, default values can be used to determine ammonia criteria. A temperature value of 25°C and a pH value of 8.0 S.U. were used to calculate the ammonia water quality standards. The ammonia water quality standards calculations are shown in Attachment 7.

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). Since the facility discharges to the reservoir and has not completed a dilution study for the discharge, no dilution is allowed, so only effluent hardness shall be considered for establishing the hardness-dependent metals water quality criteria. The hardness-dependent metals criteria in Attachment 7 are based on an effluent value of 23.7 mg/L provided as part of the facility's application for reissuance.

Bacteria Criteria:

The Virginia Water Quality Standards at 9VAC25-260-170 A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean ¹
Freshwater <i>E. coli</i> (N/100 ml)	126

¹For a minimum of four weekly samples [taken during any calendar month].

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Abel Lake, is located within Section 1c of the Potomac Basin. This section has been designated with special standards b and PWS.

Special Standard "b" (Potomac Embayment Standards) established effluent standards for all sewage plants discharging into Potomac River embayments and for expansions of existing plants discharging into non-tidal tributaries of these embayments. 9VAC25-415, Policy for the Potomac Embayments controls point source discharges of conventional pollutants into the Virginia embayment waters of the Potomac River, and their tributaries, from the fall line at Chain Bridge in Arlington County to the Route 301 Bridge in King George County. The Potomac Embayment Standards are not applied to this discharge since the discharge is industrial in nature and does not contain the pollutants of concern in appreciable amounts.

Special Standard PWS designates a public water supply intake. The Board's Water Quality Standards establish numerical standards for specific parameters calculated to protect human health from toxic effects through drinking water and fish consumption. See 9VAC25-260-140 B for applicable criteria.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 2 based on the fact that the receiving water body is a water supply reservoir. All Public water supplies are assumed to be Tier 2 unless information is available to indicate otherwise (guidance memorandum No. 00-2011). No significant degradation to the existing water quality will be allowed. In accordance with current DEQ guidance, no significant lowering of water quality is to occur where permit limits are based on the following:

- The dissolved oxygen in the receiving stream is not lowered more than 0.2 mg/L from the existing levels;
- The pH of the receiving stream is maintained within the range 6.0-9.0 S.U.;
- There is compliance with all temperature criteria applicable to the receiving stream;
- No more than 25% of the unused assimilative capacity is allocated for toxic criteria established for the protection of aquatic life; and
- No more than 10% of the unused assimilative capacity is allocated for criteria for the protection of human health.

The antidegradation policy also prohibits the expansion of mixing zones to Tier 2 waters unless the requirements of 9VAC25-260-30.A.2 are met. The draft permit is not proposing an expansion of the existing mixing zone.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10 and 1Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening:

Effluent data obtained from the permit application and Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation. Effluent data were reviewed, and the facility has had a good compliance record during the current permit term. The only Warning Letter issued to the facility was for a monthly average TSS exceedance in July 2009.

The following pollutants require a wasteload allocation analysis: Total Residual Chlorine since chlorine is used in the production of the drinking water. The application for reissuance indicates that the following dissolved metals are present in the effluent: Barium, Copper, Manganese, Iron, and Nickel.

b. Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:	WLA	=	Wasteload allocation
	C _o	=	In-stream water quality criteria
	Q _e	=	Design flow
	Q _s	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
	f	=	Decimal fraction of critical flow
	C _s	=	Mean background concentration of parameter in the receiving stream.

While the facility discharges directly to Abel Lake, no dilution is allowed since the Water Quality Standards prohibit a mixing zone unless there has been a dilution study performed by the facility and approved by Board. As such, there is no mixing zone and the WLA is equal to the C_o.

Antidegradation Wasteload Allocations (AWLAs).

Since the receiving stream has been determined to be a Tier II water, staff must also determine antidegradation wasteload allocations (AWLAs). The steady state complete mix equation is used substituting the antidegradation baseline (C_b) for the in-stream water quality criteria (C_o):

$$AWLA = \frac{C_b (Q_e + Q_s) - (C_s) (Q_s)}{Q_e}$$

Where:

AWLA	=	Antidegradation-based wasteload allocation
C_b	=	In-stream antidegradation baseline concentration
Q_e	=	Design flow
Q_s	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
C_s	=	Mean background concentration of parameter in the receiving stream.

Calculated AWLAs for the pollutants noted in b. above are presented in Attachment 7.

c. Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs and AWLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows and the mixing allowance. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.002 mg/L and a daily maximum limit of 0.005 mg/L are proposed to be carried forward with this reissuance (Attachment 8).

Metals:**Manganese:**

The facility reported a Dissolved Manganese concentration of 268 ug/L. DEQ's Northern Regional staff consulted with DEQ's Central Office to determine the appropriate permitting decision. We have determined that since the Dissolved Manganese human health criteria of 50 ug/L is a taste and odor issue, not an aquatic water quality issue, and that DEQ's Central Office will be investigating the actual need for a Manganese human health criteria with EPA in the next couple of years, the permit shall only require only semiannual effluent monitoring during the next permit term. Once the need for a human health criteria is determined to be valid or not, then it can be determined if an effluent limitation for Manganese is appropriate for this facility's discharge.

Copper:

The facility reported a Dissolved Copper concentration of 5.11 ug/L in the permit application. A statistical evaluation of this value demonstrates the need for a copper limit of 0.91 ug/L. Since there is only one data point, in lieu of a limit, staff is proposing semiannual monitoring for Dissolved Copper during the next permit term to collect more data points to determine if a limit is necessary.

Barium:

The facility reported a Dissolved Barium concentration of 14 ug/L in the permit application. Since the facility discharges to a Public Water Supply, the Human Health Criteria of 200 ug/L is applicable. It is staff's best professional judgment that there is no reasonable potential to exceed this Human Health Criteria and that no further monitoring is justified.

Iron:

The facility reported a Dissolved Iron concentration of 113 ug/L in the permit application. Since the facility discharges to a Public Water Supply, the Antidegradation Human Health Criteria of 30 ug/L is applicable. Since there is only one data point, in lieu of a limit, staff is proposing semiannual monitoring for Dissolved Iron during the next permit term to collect more data points to determine if a limit is necessary.

Nickel:

The facility reported a Dissolved Nickel concentration of 2.72 ug/L in the permit application. A statistical evaluation of this value demonstrates the need for a nickel limit of 2.73 ug/L. Since there is only one data point, in lieu of a limit, staff is proposing semiannual monitoring for Dissolved Nickel during the next permit term to collect more data points to determine if a limit is necessary.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to the total suspended solids (TSS) and pH limitations are proposed. pH limitations are set at the water quality criteria. The limit for Total Suspended Solids (TSS) is based on staff's best professional judgment.

e. Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Flow, Total Suspended Solids, pH, and Total Residual Chlorine.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

18. Antibalancing:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Maximum Flow of this Industrial Facility is 0.189 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	N/A	N/A	NL	1/M	Est
pH	3	NA	NA	6.0 s.u.	9.0 s.u.	1/M	Grab
TSS	2	30 mg/L	60 mg/L	NA	NA	1/M	5G/8H
Total Residual Chlorine	3	0.002 mg/L	0.005 mg/L	NA	NA	1/M	Grab
Dissolved Manganese (ug/L)*	3	NL	NA	NA	NL	1/6M	Grab
Dissolved Copper (ug/L)*	3	NL	NA	NA	NL	1/6M	Grab
Dissolved Iron (ug/L)*	3	NL	NA	NA	NL	1/6M	Grab
Dissolved Nickel (ug/L)*	3	NL	NA	NA	NL	1/6M	Grab
Total Hardness (mg/L as CaCO ₃)*	3	NL	NA	NA	NL	1/6M	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards

MGD = Million gallons per day.

NA = Not applicable.

NL = No limit; monitor and report.

S.U. = Standard units.

EST = Estimate

1/M = Once every month.

1/6M = Once every six months.

5G/8H = 5 Grab/Eight Hour Composite - Consisting of five (5) grab samples collected at hourly intervals until the discharge ceases or five (5) grab samples taken at equal time intervals for the duration of the discharge if the discharge is less than 8 hours in length.

EST = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

*The semiannual monitoring periods shall be January 1-June 30 and July 1-December 31. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

20. Other Permit Requirements:

- a. Part I.B. of the permit contains quantification levels and compliance reporting instructions. 9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

- a. O&M Manual Requirement.

Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

- b. Notification Levels.

The permittee shall notify the Department as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:
 - (a) One hundred micrograms per liter;
 - (b) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for

- 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;
- (c) Five times the maximum concentration value reported for that pollutant in the permit application; or
 - (d) The level established by the Board.

2. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

- (a) Five hundred micrograms per liter;
- (b) One milligram per liter for antimony;
- (c) Ten times the maximum concentration value reported for that pollutant in the permit application; or
- (d) The level established by the Board.

c. Materials Handling/Storage.

9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.

- d. TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

22. Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. **Changes to the Permit from the Previously Issued Permit:**

a. Special Conditions:

- 1) The special conditions related to the Whole Effluent Toxicity testing have been removed with this reissuance.

b. Monitoring and Effluent Limitations:

- 1) During the previous permit term, the facility monitored Whole Effluent Toxicity on an annual basis. A review of this data demonstrated that there is no toxicity present (Attachment 9); therefore, staff proposes to remove the Whole Effluent Toxicity testing with this reissuance.

- 2) Semiannual monitoring for Dissolved Copper, Dissolved Manganese, Dissolved Iron, Dissolved Nickel, and Total Hardness has been added to the permit.

24. **Variances/Alternate Limits or Conditions:**

No variances or alternate limits are proposed.

25. **Public Notice Information:**

First Public Notice Date: February 25, 2014 Second Public Notice Date: March 4, 2014

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 10 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s): None.

Staff Comments: This permit reissuance was delayed because staff had planned for the facility to apply for coverage under the Potable Water Treatment Plant General Permit (9VAC25-860) with an effective date of December 24, 2013. The facility opted to continue coverage under the individual permit.

Public Comment: There was no public comment.

Stafford County Abel Lake Water Treatment Plant
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VA0057487

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Attachment 2	NPDES Permit Rating Worksheet
Attachment 3	Facility schematic/diagram
Attachment 4	U.S.G.S. Topographic Map (Stafford 182B)
Attachment 5	Technical Inspection Report (substituting for Site Inspection which was performed by Susan Oakes & Beth Biller on August 8, 2007)
Attachment 6	Planning Statement Dated October 22, 2012
Attachment 7	Water Quality Criteria/Wasteload Allocation Spreadsheet
Attachment 8	Statistical analysis for chlorine effluent limitations
Attachment 9	Whole Effluent Toxicity Data
Attachment 10	Public Notice

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
Water Quality Assessments and Planning
629 E. Main Street P.O. Box 10009 Richmond, Virginia 23240

SUBJECT: Flow Frequency Determination
Abel Lake WTP - #VA0057487

TO: Kultar Singh, NRO

FROM: Paul E. Herman, P.E., WQAP *Paul*

DATE: March 31, 1997

COPIES: Ron Gregory, Charles Martin, File

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Northern VA. Region
Dept. of Env. Quality

The Abel Lake WTP discharges to the Abel Lake near Stafford, VA. Flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The values at the discharge point were determined by inspection of the USGS Stafford Quadrangle topographical map which shows the discharge is directly to the Abel Lake. The flow frequencies for impoundments are 0.0 cfs for the 1Q10, 7Q10, 30Q5, high flow 1Q10, high flow 7Q10, and the harmonic mean. If there are any minimum release requirements for this impoundment, they are not known.

If you have any questions concerning this analysis, please let me know.

Attachment 1

NPDES PERMIT RATING WORK SHEET

VPDES NO. : VA0057487

- ☒ Regular Addition
☐ Discretionary Addition
☐ Score change, but no status Change
☐ Deletion

Facility Name: Abel Lake Water Treatment Plant

City / County: Stafford

Receiving Water: Abel Lake

Reach Number:

Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)

2. A nuclear power Plant

3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

☐ Yes; score is 600 (stop here) ☒ NO; (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)☒ NO; (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code:

Primary Sic Code: 4941

Other Sic Codes:

Industrial Subcategory Code: 0 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	15	<input checked="" type="checkbox"/> 7.	7	35
<input type="checkbox"/> 1.	1	5	<input type="checkbox"/> 4.	4	20	<input type="checkbox"/> 8.	8	40
<input type="checkbox"/> 2.	2	10	<input type="checkbox"/> 5.	5	25	<input type="checkbox"/> 9.	9	45
			<input type="checkbox"/> 6.	6	30	<input type="checkbox"/> 10.	10	50

Code Number Checked: 7

Total Points Factor 1: 35

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

Wastewater Type (see Instructions)	Code	Points
Type I: Flow < 5 MGD	<input type="checkbox"/> 11	0
Flow 5 to 10 MGD	<input type="checkbox"/> 12	10
Flow > 10 to 50 MGD	<input type="checkbox"/> 13	20
Flow > 50 MGD	<input type="checkbox"/> 14	30
Type II: Flow < 1 MGD	<input checked="" type="checkbox"/> 21	10
Flow 1 to 5 MGD	<input type="checkbox"/> 22	20
Flow > 5 to 10 MGD	<input type="checkbox"/> 23	30
Flow > 10 MGD	<input type="checkbox"/> 24	50
Type III: Flow < 1 MGD	<input type="checkbox"/> 31	0
Flow 1 to 5 MGD	<input type="checkbox"/> 32	10
Flow > 5 to 10 MGD	<input type="checkbox"/> 33	20
Flow > 10 MGD	<input type="checkbox"/> 34	30

Section B – Wastewater and Stream Flow Considered

Wastewater Type (see Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow	Code	Points
Type I/III:	< 10 %	<input type="checkbox"/> 41	0
	10 % to < 50 %	<input type="checkbox"/> 42	10
	> 50 %	<input type="checkbox"/> 43	20
Type II:	< 10 %	<input type="checkbox"/> 51	0
	10 % to < 50 %	<input type="checkbox"/> 52	20
	> 50 %	<input type="checkbox"/> 53	30

Code Checked from Section A or B: 21

Total Points Factor 2: 10

NPDES PERMIT RATING WORK SHEET

FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutants: (check one)

☐ BOD☐ COD☒ Other: Not Applicable

Permit Limits: (check one)

- ☐ < 100 lbs/day
☐ 100 to 1000 lbs/day
☐ > 1000 to 3000 lbs/day
☐ > 3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked: NAPoints Scored: NA

B. Total Suspended Solids (TSS)

Permit Limits: (check one)

- ☒ < 100 lbs/day
☐ 100 to 1000 lbs/day
☐ > 1000 to 5000 lbs/day
☐ > 5000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked: 1Points Scored: 0

C. Nitrogen Pollutants: (check one)

☐ Ammonia☒ Other: Not Applicable

Permit Limits: (check one)

- Nitrogen Equivalent*
☐ < 300 lbs/day
☐ 300 to 1000 lbs/day
☐ > 1000 to 3000 lbs/day
☐ > 3000 lbs/day

Code	Points
1	0
2	5
3	15
4	20

Code Number Checked: NAPoints Scored: NATotal Points Factor 3: 0**FACTOR 4: Public Health Impact**

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.

☒ YES; (If yes, check toxicity potential number below)☐ NO; (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1. (Be sure to use the *Human Health* toxicity group column – check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
<input type="checkbox"/> No process waste streams	0	0	<input type="checkbox"/> 3.	3	0	<input checked="" type="checkbox"/> 7.	7	15
<input type="checkbox"/> 1.	1	0	<input type="checkbox"/> 4.	4	0	<input type="checkbox"/> 8.	8	20
<input type="checkbox"/> 2.	2	0	<input type="checkbox"/> 5.	5	5	<input type="checkbox"/> 9.	9	25
			<input type="checkbox"/> 6.	6	10	<input type="checkbox"/> 10.	10	30

Code Number Checked: 7Total Points Factor 4: 15

NPDES PERMIT RATING WORK SHEET

FACTOR 5: Water Quality Factors

- A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-base federal effluent guidelines, or technology-base state effluent guidelines), or has a wasteload allocation been to the discharge*

	Code	Points
<input checked="" type="checkbox"/> YES	1	10
<input type="checkbox"/> NO	2	0

- B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

	Code	Points
<input checked="" type="checkbox"/> YES	1	0
<input type="checkbox"/> NO	2	5

- C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

	Code	Points
<input type="checkbox"/> YES	1	10
<input checked="" type="checkbox"/> NO	2	0

Code Number Checked: A 1 + B 1 + C 2
 Points Factor 5: A 10 + B 0 + C 0 = 10

FACTOR 6: Proximity to Near Coastal Waters

- A. Base Score: Enter flow code here (from factor 2) 21

Check appropriate facility HPRI code (from PCS):

Enter the multiplication factor that corresponds to the flow code: 0.10

HPRI#	Code	HPRI Score	Flow Code	Multiplication Factor
<input type="checkbox"/> 1	1	20	11, 31, or 41	0.00
<input type="checkbox"/> 2	2	0	12, 32, or 42	0.05
<input type="checkbox"/> 3	3	30	13, 33, or 43	0.10
<input type="checkbox"/> 4	4	0	14 or 34	0.15
<input checked="" type="checkbox"/> 5	5	20	21 or 51	0.10
			22 or 52	0.30
			23 or 53	0.60
			24	1.00

HPRI code checked: 4

Base Score (HPRI Score): 0 X (Multiplication Factor) 0.10 = 0

B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
<input type="checkbox"/> YES	1	10
<input checked="" type="checkbox"/> NO	2	0

C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 area's of concern (see instructions)?

	Code	Points
<input type="checkbox"/> YES	1	10
<input checked="" type="checkbox"/> NO	2	0

Code Number Checked: A 4 + B 2 + C 2
 Points Factor 6: A 0 + B 0 + C 0 = 0

NPDES PERMIT RATING WORK SHEET

SCORE SUMMARY

<u>Factor</u>	<u>Description</u>	<u>Total Points</u>
1	Toxic Pollutant Potential	35
2	Flows / Streamflow Volume	10
3	Conventional Pollutants	0
4	Public Health Impacts	15
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	0
TOTAL (Factors 1 through 6)		70

S1. Is the total score equal to or greater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES; (Add 500 points to the above score and provide reason below:

Reason: _____

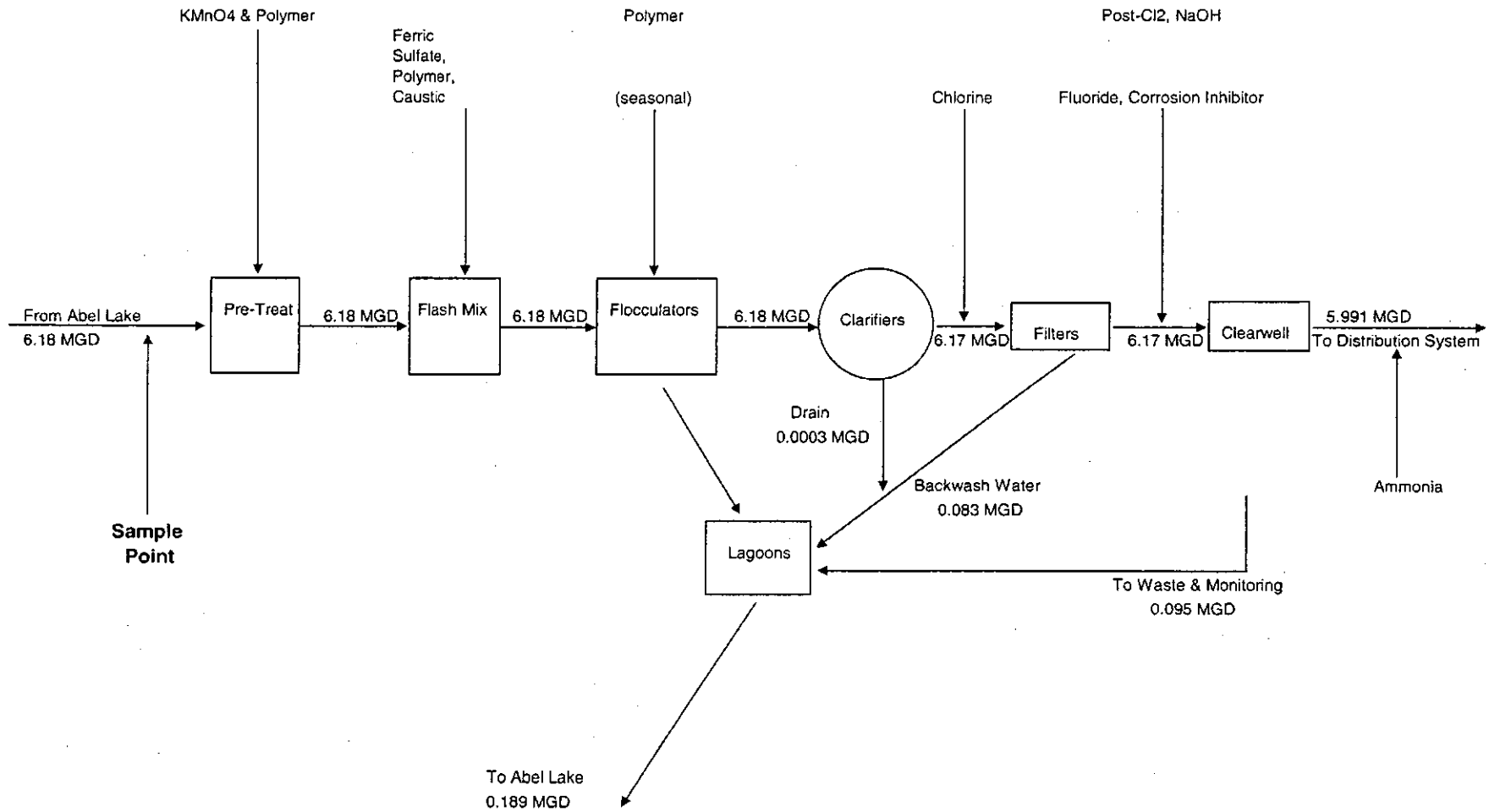
NEW SCORE : 70
OLD SCORE : 70

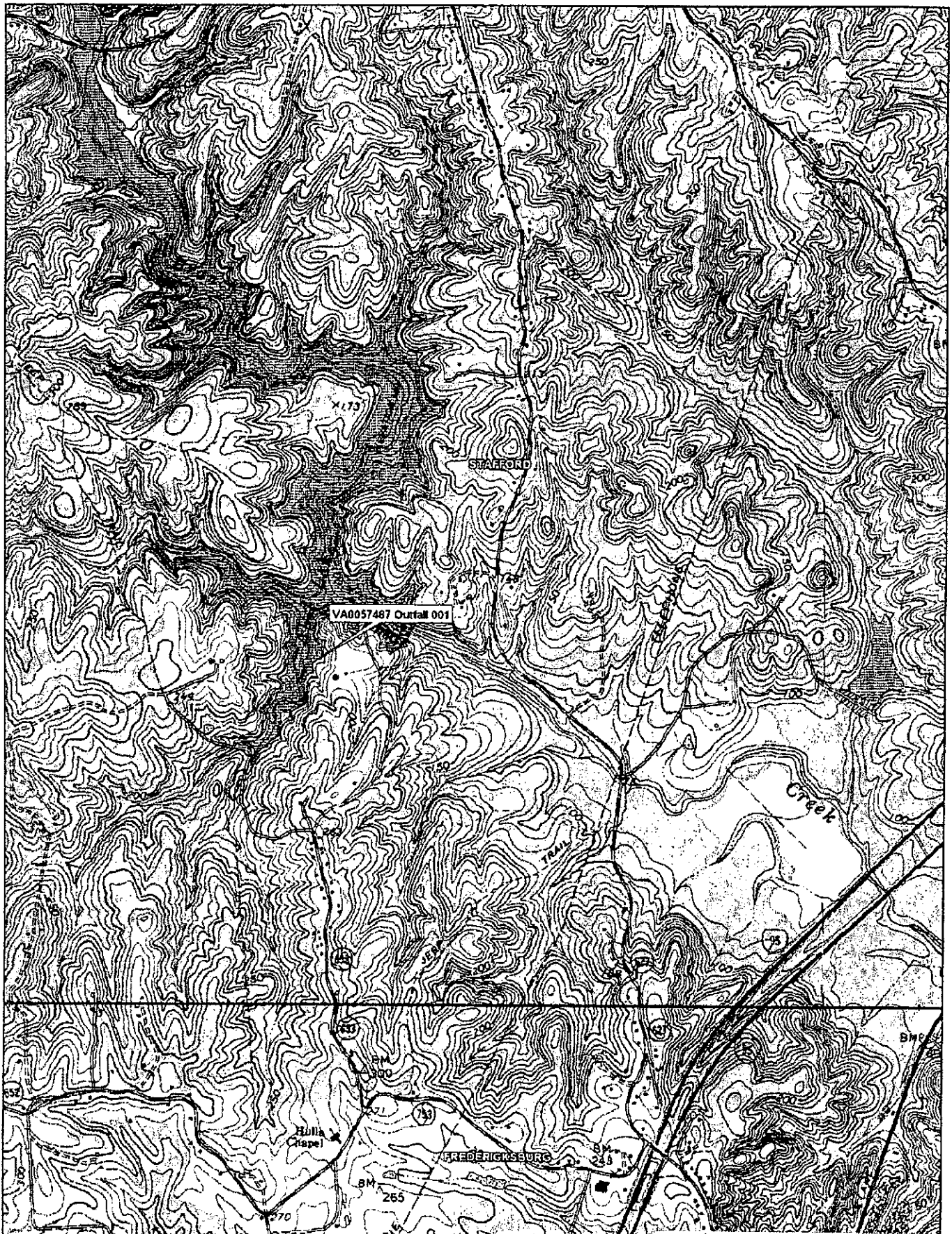
Permit Reviewer's Name : Alison Thompson

Phone Number: (703)583-3834

Date: January 6, 2014

Schematic of Water Flow Abel Lake Water Treatment Facility Stafford County, Virginia

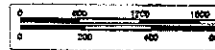




DELORME

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Scale 1:2
1" = 187'



Attachment 4



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN VIRGINIA REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3801
www.deq.virginia.gov

Preston Bryant
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

August 16, 2007

Mr. Harry L. Critzer
Assistant Director of Utilities
1300 Courthouse Road
P.O. Box 339
Stafford, VA 22555-0339

Re: Abel Lake WTP – VA0057487

Dear Mr. Critzer:

Attached are copies of the laboratory and technical inspection reports generated from observations made while performing a Facility Technical Inspection at the Abel Lake - Water Treatment Plant (WTP) on August 8, 2007. The water compliance staff would like to thank Mr. Matt Sauter and staff for their time and assistance during the inspection.

Deficiencies were noted during the laboratory inspection. As discussed at the time of inspection EPA published an update to 40 CFR Part 136 on March 12, 2007. Any methods currently in use for compliance monitoring (pH, TSS, Chlorine) need to be reviewed to ensure they are still approved. Any required changes must be implemented by September 12, 2007 (DMR due October 10, 2007). I've enclosed a copy of the summary table and foot notes with this inspection report.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Virginia Regional Office at (703) 583-3896 or by email at ebiller@deg.virginia.gov.

Sincerely,

A handwritten signature in cursive script that reads "Beth Biller".

Beth Biller
Environmental Specialist II

cc: Permits/DMR file
Compliance Inspector
Compliance Manager
Compliance Auditor

Attachment 5

WASTEWATER FACILITY INSPECTION REPORT

PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0057487	January 7, 2003		January 6, 2008
Facility Name	Address		Telephone Number
Abel Lake WTP	121 Moorwood Drive Falmouth, VA 22406		(540) 374-9376
Owner Name	Address		Telephone Number
Stafford County Utilities	P.O. Box, 339, Stafford, VA 22554		(540) 659-8695
Responsible Official	Title		Telephone Number
Harry Critzer	Asst. Director of Utilities		(540) 659-8620
Responsible Operator	Operator Cert. Class/number		Telephone Number
Matt Sauter	Water I/1901 000734		(540) 374-9376

TYPE OF FACILITY:

DOMESTIC				INDUSTRIAL			
Federal		Major		Major		Primary	
Non-federal		Minor		Minor	X	Secondary	

INFLUENT CHARACTERISTICS:

DESIGN:

	Flow	0.182 MGD	
	Population Served	38,467	
	Connections Served	12,530	

EFFLUENT LIMITS: (mg/L unless specified)

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
Flow (MGD)		NL		TSS		30	60
pH (s.u.)	6.0		9.0	TRC		0.002	0.005

	Receiving Stream	Abel Lake	
	Basin	Potomac River	
	Discharge Point (LAT)	38° 23' 19'	
	Discharge Point (LONG)	77° 29' 19'	



NORTHERN VIRGINIA REGIONAL OFFICE
13901 CROWN COURT, WOODBRIDGE, VA. 22193
PHONE: (703) 583-3800 FAX: (703) 583-3871

SITE INSPECTION REPORT

FACILITY NAME:	Abel Lake WTP				
PERMIT NUMBER:	VA0057487	INSPECTION DATE:	8/9/07	REPORT DATE:	8/14/07
INSPECTOR:	Beth Biller	REVIEWER	Ed Stuart	DATE	8/15/07
PRESENT AT INSPECTION:	Susan Oakes – DEQ; Matt Sauter – Plant Manager				

Inspection Type:

<input type="checkbox"/>	Compliance	WL/NOV#:	<input type="checkbox"/>	Announced
<input type="checkbox"/>	Sampling		<input checked="" type="checkbox"/>	Scheduled
<input checked="" type="checkbox"/>	Other: Technical			

Observation Section:

- ▶ Arrived on-site @ 0920.
- ▶ Weather conditions were mostly cloudy, hot, humid, temperatures in the 90s.
- ▶ We introduced ourselves to plant staff and explained the purpose of our visit.
- ▶ Mr. Sauter provided a tour of the facility:
 - An electrical upgrade is in progress.
 - A new generator has been installed and was tested under load at the time of installation.
 - Regular testing will occur once per week for 30 minutes (Mondays)
 - Testing under a full load will occur once per quarter.
 - The treatment works consists of 2 trains:
 - Raw water enters the influent splitter where potassium permanganate and caustic are added prior to entering the flash mixer.
 - At the time of inspection the mixer paddle has been removed. The mixer bearings wore out; a replacement has been ordered and is in transit (shipped 7/25/07).
 - Flow then enters another splitter where it is pumped to the upflow clarifiers. The units are cleaned twice per year.
 - Sludge is blown down for 5 minutes per shift/per clarifier and transferred to one of the two lagoons.
 - Polymer and Chlorine are added prior to flow entering the Green Leaf Filters. The filters consist of 3 inches of torpedo sand, 18 inches of filter sand, and 18 inches of anthracite.

Observation Section *continued*:

- Backwash is based on head loss and turbidity, currently every 20-30 hours.
 - Backwash is dechlorinated prior to entering the lagoons.
 - At the filter sump pumps caustic, chlorine, and fluoride are added.
 - Caustic is currently being fed from the bulk storage tanks. Fiberglass particles were discovered in the day tanks causing them to clog.
 - A new fluoride shipment was just received, prior to receipt facility was not feeding fluoride.
 - Ammonia addition is also possible for chloramines removal.
 - All controls are automatic with a manual option. Telemetry is monitored in the operations building.
 - A backup generator is tested every two weeks under full load.
- Departed site @ 1020.

PHOTOGRAPH LOG

- Photos taken by Beth Biller
- Photos can be located on the DEQ U drive @ Photos - Water Facilities – Abel Lake WTP (VA0057487).
- Photos are included with this report.

Compliance Section:

DMR VIOLATION(S): None

INSPECTION VIOLATION(S): None

CAUSE OF VIOLATION(S):

CORRECTIVE ACTION(S) TAKEN:

Sampling Section: NA

To: Alison Thompson
From: Jennifer Carlson

Date: October 22, 2012
Subject: Planning Statement for Abel Lake WTP
Permit Number: VA0057487

Information for Outfall 001:

Discharge Type: Industrial
Discharge Flow: 0.182 MGD
Receiving Stream: Abel Lake
Latitude / Longitude: 38° 23' 19" N / 77° 29' 1.9" W
Rivermile: 0.13
Streamcode: 1aXHW
Waterbody: VAN-A29L
Water Quality Standards: Class III, Section 1c, special standard PWS, b
Drainage Area: 1.3 mi²

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

This facility discharges into the southern arm of Abel Lake. The nearest downstream DEQ ambient monitoring station is 1aPOM013.02, located near the dam, approximately 0.34 miles downstream of Outfall 001. The following is the water quality summary for the southern arm of Abel Lake, as taken from the Draft 2012 Integrated Assessment*:

Class III, Section 1c, special stds. PWS, b.

No monitoring station exists in this segment, but temperature and dissolved oxygen values from station 1aPOM013.02 are pooled for the entire impoundment.

The aquatic life use is considered fully supporting. The fish consumption, public water supply, recreation, and wildlife uses were not assessed.

** Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently awaiting final approval.*

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

No.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

Table B. Information on Downstream 303(d) Impairments and TMDLs

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the Draft 2012 Integrated Report*							
Potomac Creek	Recreation	<i>E. coli</i>	5.8 miles	No	---	---	2016
	Fish Consumption	PCBs	7.9 miles	Tidal Potomac PCB 10/31/2007	None	N/A	---

* Virginia's Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently being finalized and prepared for release.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There is a downstream PCB impairment in the tidal portion of Potomac Creek, which is located approximately 8 miles downstream of this facility. A PCB TMDL has been completed for the Potomac River and was approved by EPA on 10/31/2007. DEQ Staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is a water treatment facility and is highly unlikely to discharge any PCBs.

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

The public water supply intake for Abel Lake WTP is located within 5 miles of the discharge location.

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Abel Lake WTP

Permit No.: VA005487

Receiving Stream: Abel Lake

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO₃) = mg/L
 90% Temperature (Annual) = deg C
 90% Temperature (Wet season) = deg C
 90% Maximum pH = SU
 10% Maximum pH = SU
 Tier Designation (1 or 2) = 2
 Public Water Supply (PWS) Y/N? = y
 Trout Present Y/N? = n
 Early Life Stages Present Y/N? = y

Stream Flows

1Q10 (Annual) = 0 MGD
 7Q10 (Annual) = 0 MGD
 30Q10 (Annual) = 0 MGD
 1Q10 (Wet season) = 0 MGD
 30Q10 (Wet season) = 0 MGD
 30Q5 = 0 MGD
 Harmonic Mean = 0 MGD

Mixing Information

Annual - 1Q10 Mix = 100 %
 - 7Q10 Mix = 100 %
 - 30Q10 Mix = 100 %
 Wet Season - 1Q10 Mix = 100 %
 - 30Q10 Mix = 100 %

Effluent Information

Mean Hardness (as CaCO₃) = 23.7 mg/L
 90% Temp (Annual) = 25 deg C
 90% Temp (Wet season) = deg C
 90% Maximum pH = 8 SU
 10% Maximum pH = SU
 Discharge Flow = 0.189 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	6.7E+02	9.9E+02	--	--	6.7E+02	9.9E+02	--	--	6.7E+01	9.9E+01	--	--	6.7E+01	9.9E+01	--	--	6.7E+01	9.9E+01
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	6.1E+00	9.3E+00	--	--	6.1E-01	9.3E-01	--	--	6.1E-01	9.3E-01	--	--	6.1E-01	9.3E-01
Acrylonitrile ^C	0	--	--	5.1E-01	2.5E+00	--	--	5.1E-01	2.5E+00	--	--	5.1E-02	2.5E-01	--	--	5.1E-02	2.5E-01	--	--	5.1E-02	2.5E-01
Aldrin ^C (Annual) (High Flow)	0	3.0E+00	--	4.9E-04	5.0E-04	3.0E+00	--	4.9E-04	5.0E-04	7.5E-01	--	4.9E-05	5.0E-05	7.5E-01	--	4.9E-05	5.0E-05	7.5E-01	--	4.9E-05	5.0E-05
(Yearly)	0	8.41E+00	1.24E+00	--	--	8.41E+00	1.24E+00	--	--	2.10E+00	3.10E-01	--	--	2.10E+00	3.10E-01	--	--	2.10E+00	3.10E-01	--	--
(High Flow)	0	8.41E+00	2.43E+00	--	--	8.41E+00	2.43E+00	--	--	2.10E+00	6.08E-01	--	--	2.10E+00	6.08E-01	--	--	2.10E+00	6.08E-01	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	8.3E+03	4.0E+04	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.6E+00	6.4E+02	--	--	5.6E-01	6.4E+01	--	--	5.6E-01	6.4E+01	--	--	5.6E-01	6.4E+01
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.4E+02	1.5E+02	1.0E+01	--	8.5E+01	3.8E+01	1.0E+00	--	8.5E+01	3.8E+01	1.0E+00	--	8.5E+01	3.8E+01	1.0E+00	--
Barium	0	--	--	2.0E+03	--	--	--	2.0E+03	--	--	--	2.0E+02	--	--	--	2.0E+02	--	--	--	2.0E+02	--
Benzene ^C	0	--	--	2.2E+01	5.1E+02	--	--	2.2E+01	5.1E+02	--	--	2.2E+00	5.1E+01	--	--	2.2E+00	5.1E+01	--	--	2.2E+00	5.1E+01
Benzidine ^C	0	--	--	8.6E-04	2.0E-03	--	--	8.6E-04	2.0E-03	--	--	8.6E-05	2.0E-04	--	--	8.6E-05	2.0E-04	--	--	8.6E-05	2.0E-04
Benzo (a) anthracene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (b) fluoranthene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (k) fluoranthene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Benzo (a) pyrene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Bis(2-Chloroethyl) Ether ^C	0	--	--	3.0E-01	5.3E+00	--	--	3.0E-01	5.3E+00	--	--	3.0E-02	5.3E-01	--	--	3.0E-02	5.3E-01	--	--	3.0E-02	5.3E-01
Bis(2-Chloroisopropyl) Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.4E+03	6.5E+04	--	--	1.4E+02	6.5E+03	--	--	1.4E+02	6.5E+03	--	--	1.4E+02	6.5E+03
Bis 2-Ethylhexyl Phthalate ^C	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+01	2.2E+01	--	--	1.2E+00	2.2E+00	--	--	1.2E+00	2.2E+00	--	--	1.2E+00	2.2E+00
Bromoform ^C	0	--	--	4.3E+01	1.4E+03	--	--	4.3E+01	1.4E+03	--	--	4.3E+00	1.4E+02	--	--	4.3E+00	1.4E+02	--	--	4.3E+00	1.4E+02
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.5E+03	1.9E+03	--	--	1.5E+02	1.9E+02	--	--	1.5E+02	1.9E+02	--	--	1.5E+02	1.9E+02
Cadmium	0	8.2E-01	3.8E-01	5.0E+00	--	8.2E-01	3.8E-01	5.0E+00	--	2.1E-01	9.5E-02	5.0E-01	--	2.1E-01	9.5E-02	5.0E-01	--	2.1E-01	9.5E-02	5.0E-01	--
Carbon Tetrachloride ^C	0	--	--	2.3E+00	1.6E+01	--	--	2.3E+00	1.6E+01	--	--	2.3E-01	1.6E+00	--	--	2.3E-01	1.6E+00	--	--	2.3E-01	1.6E+00
Chlordane ^C	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.4E+00	4.3E-03	8.0E-03	8.1E-03	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.0E-01	1.1E-03	8.0E-04	8.1E-04	6.0E-01	1.1E-03	8.0E-04	8.1E-04
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	8.6E+05	2.3E+05	2.5E+05	--	2.2E+05	5.8E+04	2.5E+04	--	2.2E+05	5.8E+04	2.5E+04	--	2.2E+05	5.8E+04	2.5E+04	--
TRC	0	1.9E+01	1.1E+01	--	--	1.9E+01	1.1E+01	--	--	4.8E+00	2.8E+00	--	--	4.8E+00	2.8E+00	--	--	4.8E+00	2.8E+00	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.3E+02	1.6E+03	--	--	1.3E+01	1.6E+02	--	--	1.3E+01	1.6E+02	--	--	1.3E+01	1.6E+02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane ^C	0	--	--	4.0E+00	1.3E+02	--	--	4.0E+00	1.3E+02	--	--	4.0E+01	1.3E+01	--	--	4.0E+01	1.3E+01	--	--	4.0E+01	1.3E+01
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.4E+02	1.1E+04	--	--	3.4E+01	1.1E+03	--	--	3.4E+01	1.1E+03	--	--	3.4E+01	1.1E+03
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.0E+03	1.6E+03	--	--	1.0E+02	1.6E+02	--	--	1.0E+02	1.6E+02	--	--	1.0E+02	1.6E+02
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	8.1E+01	1.5E+02	--	--	8.1E+00	1.5E+01	--	--	8.1E+00	1.5E+01	--	--	8.1E+00	1.5E+01
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	8.3E-02	4.1E-02	--	--	2.1E-02	1.0E-02	--	--	2.1E-02	1.0E-02	--	--	2.1E-02	1.0E-02	--	--
Chromium III	0	1.8E+02	2.4E+01	--	--	1.8E+02	2.4E+01	--	--	4.6E+01	6.0E+00	--	--	4.6E+01	6.0E+00	--	--	4.6E+01	6.0E+00	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.6E+01	1.1E+01	--	--	4.0E+00	2.8E+00	--	--	4.0E+00	2.8E+00	--	--	4.0E+00	2.8E+00	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--	--	1.0E+01	--
Chrysene ^C	0	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-04	1.8E-03	--	--	3.8E-04	1.8E-03	--	--	3.8E-04	1.8E-03
Copper	0	3.6E+00	2.7E+00	1.3E+03	--	3.6E+00	2.7E+00	1.3E+03	--	9.1E-01	6.8E-01	1.3E+02	--	9.1E-01	6.8E-01	1.3E+02	--	9.1E-01	6.8E-01	1.3E+02	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.2E+01	5.2E+00	1.4E+02	1.6E+04	5.5E+00	1.3E+00	1.4E+01	1.6E+03	5.5E+00	1.3E+00	1.4E+01	1.6E+03	5.5E+00	1.3E+00	1.4E+01	1.6E+03
DDD ^C	0	--	--	3.1E-03	3.1E-03	--	--	3.1E-03	3.1E-03	--	--	3.1E-04	3.1E-04	--	--	3.1E-04	3.1E-04	--	--	3.1E-04	3.1E-04
DDE ^C	0	--	--	2.2E-03	2.2E-03	--	--	2.2E-03	2.2E-03	--	--	2.2E-04	2.2E-04	--	--	2.2E-04	2.2E-04	--	--	2.2E-04	2.2E-04
DDT ^C	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.1E+00	1.0E-03	2.2E-03	2.2E-03	2.8E-01	2.5E-04	2.2E-04	2.2E-04	2.8E-01	2.5E-04	2.2E-04	2.2E-04	2.8E-01	2.5E-04	2.2E-04	2.2E-04
Demeton	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.7E-01	1.7E-01	--	--	4.3E-02	4.3E-02	--	--	4.3E-02	4.3E-02	--	--	4.3E-02	4.3E-02	--	--
Dibenz(a,h)anthracene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	4.2E+02	1.3E+03	--	--	4.2E+01	1.3E+02	--	--	4.2E+01	1.3E+02	--	--	4.2E+01	1.3E+02
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.2E+02	9.6E+02	--	--	3.2E+01	9.6E+01	--	--	3.2E+01	9.6E+01	--	--	3.2E+01	9.6E+01
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	6.3E+01	1.9E+02	--	--	6.3E+00	1.9E+01	--	--	6.3E+00	1.9E+01	--	--	6.3E+00	1.9E+01
3,3-Dichlorobenzidine ^C	0	--	--	2.1E-01	2.8E-01	--	--	2.1E-01	2.8E-01	--	--	2.1E-02	2.8E-02	--	--	2.1E-02	2.8E-02	--	--	2.1E-02	2.8E-02
Dichlorobromomethane ^C	0	--	--	5.5E+00	1.7E+02	--	--	5.5E+00	1.7E+02	--	--	5.5E-01	1.7E+01	--	--	5.5E-01	1.7E+01	--	--	5.5E-01	1.7E+01
1,2-Dichloroethane ^C	0	--	--	3.8E+00	3.7E+02	--	--	3.8E+00	3.7E+02	--	--	3.8E-01	3.7E+01	--	--	3.8E-01	3.7E+01	--	--	3.8E-01	3.7E+01
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.3E+02	7.1E+03	--	--	3.3E+01	7.1E+02	--	--	3.3E+01	7.1E+02	--	--	3.3E+01	7.1E+02
1,2-Trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.4E+02	1.0E+04	--	--	1.4E+01	1.0E+03	--	--	1.4E+01	1.0E+03	--	--	1.4E+01	1.0E+03
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.7E+01	2.9E+02	--	--	7.7E+00	2.9E+01	--	--	7.7E+00	2.9E+01	--	--	7.7E+00	2.9E+01
2,4-Dichlorophenoxy acetic acid (2,4-DCPAA)	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	1.0E+01	--	--	--	1.0E+01	--	--	--	1.0E+01	--
1,2-Dichloropropane ^C	0	--	--	5.0E+00	1.5E+02	--	--	5.0E+00	1.5E+02	--	--	5.0E-01	1.5E+01	--	--	5.0E-01	1.5E+01	--	--	5.0E-01	1.5E+01
1,3-Dichloropropene ^C	0	--	--	3.4E+00	2.1E+02	--	--	3.4E+00	2.1E+02	--	--	3.4E-01	2.1E+01	--	--	3.4E-01	2.1E+01	--	--	3.4E-01	2.1E+01
Dieldrin ^C	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.4E-01	5.6E-02	5.2E-04	5.4E-04	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.0E-02	1.4E-02	5.2E-05	5.4E-05	6.0E-02	1.4E-02	5.2E-05	5.4E-05
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.7E+04	4.4E+04	--	--	1.7E+03	4.4E+03	--	--	1.7E+03	4.4E+03	--	--	1.7E+03	4.4E+03
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.8E+02	8.5E+02	--	--	3.8E+01	8.5E+01	--	--	3.8E+01	8.5E+01	--	--	3.8E+01	8.5E+01
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.7E+05	1.1E+06	--	--	2.7E+04	1.1E+05	--	--	2.7E+04	1.1E+05	--	--	2.7E+04	1.1E+05
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.0E+03	4.5E+03	--	--	2.0E+02	4.5E+02	--	--	2.0E+02	4.5E+02	--	--	2.0E+02	4.5E+02
2,4-Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.9E+01	5.3E+03	--	--	6.9E+00	5.3E+02	--	--	6.9E+00	5.3E+02	--	--	6.9E+00	5.3E+02
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.3E+01	2.8E+02	--	--	1.3E+00	2.8E+01	--	--	1.3E+00	2.8E+01	--	--	1.3E+00	2.8E+01
2,4-Dinitrotoluene ^C	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+00	3.4E+01	--	--	1.1E-01	3.4E+00	--	--	1.1E-01	3.4E+00	--	--	1.1E-01	3.4E+00
1,2,3,4-tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	5.0E-08	5.1E-08	--	--	5.0E-09	5.1E-09	--	--	5.0E-09	5.1E-09	--	--	5.0E-09	5.1E-09
1,2-Diphenylhydrazine ^C	0	--	--	3.6E-01	2.0E+00	--	--	3.6E-01	2.0E+00	--	--	3.6E-02	2.0E-01	--	--	3.6E-02	2.0E-01	--	--	3.6E-02	2.0E-01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00	5.5E-02	1.4E-02	6.2E+00	8.9E+00
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	5.5E-02	1.4E-02	--	--	5.5E-02	1.4E-02	--	--	5.5E-02	1.4E-02	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	6.2E+01	8.9E+01	--	--	6.2E+00	8.9E+00	--	--	6.2E+00	8.9E+00	--	--	6.2E+00	8.9E+00
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	8.6E-02	3.6E-02	5.9E-02	6.0E-02	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.2E-02	9.0E-03	5.9E-03	6.0E-03	2.2E-02	9.0E-03	5.9E-03	6.0E-03
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.9E-01	3.0E-01	--	--	2.9E-02	3.0E-02	--	--	2.9E-02	3.0E-02	--	--	2.9E-02	3.0E-02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	5.3E+02	2.1E+03	--	--	5.3E+01	2.1E+02	--	--	5.3E+01	2.1E+02	--	--	5.3E+01	2.1E+02
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.3E+02	1.4E+02	--	--	1.3E+01	1.4E+01	--	--	1.3E+01	1.4E+01	--	--	1.3E+01	1.4E+01
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	1.1E+03	5.3E+03	--	--	1.1E+02	5.3E+02	--	--	1.1E+02	5.3E+02	--	--	1.1E+02	5.3E+02
Foaming Agents	0	--	--	5.0E+02	--	--	--	5.0E+02	--	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+01	--
Guthion	0	--	1.0E-02	--	--	--	1.0E-02	--	--	--	2.5E-03	--	--	--	2.5E-03	--	--	--	2.5E-03	--	--
Heptachlor ^C	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.3E-01	9.5E-04	7.9E-05	7.9E-05	1.3E-01	9.5E-04	7.9E-05	7.9E-05
Heptachlor Epoxide ^C	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.3E-01	9.5E-04	3.9E-05	3.9E-05	1.3E-01	9.5E-04	3.9E-05	3.9E-05
Hexachlorobenzene ^C	0	--	--	2.8E-03	2.9E-03	--	--	2.8E-03	2.9E-03	--	--	2.8E-04	2.9E-04	--	--	2.8E-04	2.9E-04	--	--	2.8E-04	2.9E-04
Hexachlorobutadiene ^C	0	--	--	4.4E+00	1.8E+02	--	--	4.4E+00	1.8E+02	--	--	4.4E-01	1.8E+01	--	--	4.4E-01	1.8E+01	--	--	4.4E-01	1.8E+01
Hexachlorocyclohexane	0	--	--	2.6E-02	4.9E-02	--	--	2.6E-02	4.9E-02	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03
Alpha-BHC ^C	0	--	--	2.6E-02	4.9E-02	--	--	2.6E-02	4.9E-02	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03	--	--	2.6E-03	4.9E-03
Hexachlorocyclohexane	0	--	--	9.1E-02	1.7E-01	--	--	9.1E-02	1.7E-01	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02
Beta-BHC ^C	0	--	--	9.1E-02	1.7E-01	--	--	9.1E-02	1.7E-01	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02
Hexachlorocyclohexane	0	--	--	9.1E-02	1.7E-01	--	--	9.1E-02	1.7E-01	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02	--	--	9.1E-03	1.7E-02
Gamma-BHC ^C (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	9.5E-01	--	9.8E-01	1.8E+00	2.4E-01	--	9.8E-02	1.8E-01	2.4E-01	--	9.8E-02	1.8E-01	2.4E-01	--	9.8E-02	1.8E-01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	4.0E+01	1.1E+03	--	--	4.0E+00	1.1E+02	--	--	4.0E+00	1.1E+02	--	--	4.0E+00	1.1E+02
Hexachloroethane ^C	0	--	--	1.4E+01	3.3E+01	--	--	1.4E+01	3.3E+01	--	--	1.4E+00	3.3E+00	--	--	1.4E+00	3.3E+00	--	--	1.4E+00	3.3E+00
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	2.0E+00	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--
Indeno (1,2,3-cd) pyrene ^C	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02
Iron	0	--	--	3.0E+02	--	--	--	3.0E+02	--	--	--	3.0E+01	--	--	--	3.0E+01	--	--	--	3.0E+01	--
Isophorone ^C	0	--	--	3.5E+02	9.6E+03	--	--	3.5E+02	9.6E+03	--	--	3.5E+01	9.6E+02	--	--	3.5E+01	9.6E+02	--	--	3.5E+01	9.6E+02
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	2.0E+01	2.3E+00	1.5E+01	--	2.0E+01	2.3E+00	1.5E+01	--	5.1E+00	5.8E-01	1.5E+00	--	5.1E+00	5.8E-01	1.5E+00	--	5.1E+00	5.8E-01	1.5E+00	--
Malathion	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--	--	2.5E-02	--	--
Manganese	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	5.0E+00	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	3.5E-01	1.9E-01	--	--	3.5E-01	1.9E-01	--	--	3.5E-01	1.9E-01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	4.7E+01	1.5E+03	--	--	4.7E+00	1.5E+02	--	--	4.7E+00	1.5E+02	--	--	4.7E+00	1.5E+02
Methylene Chloride ^C	0	--	--	4.6E+01	5.9E+03	--	--	4.6E+01	5.9E+03	--	--	4.6E+00	5.9E+02	--	--	4.6E+00	5.9E+02	--	--	4.6E+00	5.9E+02
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	3.0E-02	1.0E+02	--	--	7.5E-03	1.0E+01	--	--	7.5E-03	1.0E+01	--	--	7.5E-03	1.0E+01	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	5.6E+01	6.3E+00	6.1E+02	4.6E+03	5.6E+01	6.3E+00	6.1E+02	4.6E+03	1.4E+01	1.6E+00	6.1E+01	4.6E+02	1.4E+01	1.6E+00	6.1E+01	4.6E+02	1.4E+01	1.6E+00	6.1E+01	4.6E+02
Nitrate (as N)	0	--	--	1.0E+04	--	--	--	1.0E+04	--	--	--	1.0E+03	--	--	--	1.0E+03	--	--	--	1.0E+03	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.7E+01	6.9E+02	--	--	1.7E+00	6.9E+01	--	--	1.7E+00	6.9E+01	--	--	1.7E+00	6.9E+01
N-Nitrosodimethylamine ^C	0	--	--	6.9E-03	3.0E+01	--	--	6.9E-03	3.0E+01	--	--	6.9E-04	3.0E+00	--	--	6.9E-04	3.0E+00	--	--	6.9E-04	3.0E+00
N-Nitrosodiphenylamine ^C	0	--	--	3.3E+01	6.0E+01	--	--	3.3E+01	6.0E+01	--	--	3.3E+00	6.0E+00	--	--	3.3E+00	6.0E+00	--	--	3.3E+00	6.0E+00
N-Nitrosodi-n-propylamine ^C	0	--	--	5.0E-02	5.1E+00	--	--	5.0E-02	5.1E+00	--	--	5.0E-03	5.1E-01	--	--	5.0E-03	5.1E-01	--	--	5.0E-03	5.1E-01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	--	--	7.0E+00	1.7E+00	--	--	7.0E+00	1.7E+00	--	--	7.0E+00	1.7E+00	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	6.5E-02	1.3E-02	--	--	1.6E-02	3.3E-03	--	--	1.6E-02	3.3E-03	--	--	1.6E-02	3.3E-03	--	--
PCB Total ^C	0	--	1.4E-02	6.4E-04	6.4E-04	--	1.4E-02	6.4E-04	6.4E-04	--	3.5E-03	6.4E-05	6.4E-05	--	3.5E-03	6.4E-05	6.4E-05	--	3.5E-03	6.4E-05	6.4E-05
Pentachlorophenol ^C	0	7.7E-03	5.9E-03	2.7E+00	3.0E+01	7.7E-03	5.9E-03	2.7E+00	3.0E+01	1.9E-03	1.5E-03	2.7E-01	3.0E+00	1.9E-03	1.5E-03	2.7E-01	3.0E+00	1.9E-03	1.5E-03	2.7E-01	3.0E+00
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	1.0E+04	8.6E+05	--	--	1.0E+03	8.6E+04	--	--	1.0E+03	8.6E+04	--	--	1.0E+03	8.6E+04
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	8.3E+02	4.0E+03	--	--	8.3E+01	4.0E+02	--	--	8.3E+01	4.0E+02	--	--	8.3E+01	4.0E+02
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
(pCi/L)	0	--	--	1.5E+01	--	--	--	1.5E+01	--	--	--	1.5E+00	--	--	--	1.5E+00	--	--	--	1.5E+00	--
Radon and Thoron Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	4.0E+00	--	--	--	4.0E-01	--	--	--	4.0E-01	--	--	--	4.0E-01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	5.0E-01	--	--	--	5.0E-01	--	--	--	5.0E-01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	3.0E+01	--	--	--	3.0E+00	--	--	--	3.0E+00	--	--	--	3.0E+00	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.0E+01	5.0E+00	1.7E+02	4.2E+03	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.0E+00	1.3E+00	1.7E+01	4.2E+02	5.0E+00	1.3E+00	1.7E+01	4.2E+02
Silver	0	3.2E-01	--	--	--	3.2E-01	--	--	--	7.9E-02	--	--	--	7.9E-02	--	--	--	7.9E-02	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.5E+05	--	--	--	2.5E+04	--	--	--	2.5E+04	--	--	--	2.5E+04	--
1,1,2,2-Tetrachloroethane ^C	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+00	4.0E+01	--	--	1.7E-01	4.0E+00	--	--	1.7E-01	4.0E+00	--	--	1.7E-01	4.0E+00
Tetrachloroethylene ^C	0	--	--	6.9E+00	3.3E+01	--	--	6.9E+00	3.3E+01	--	--	6.9E-01	3.3E+00	--	--	6.9E-01	3.3E+00	--	--	6.9E-01	3.3E+00
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.4E-01	4.7E-01	--	--	2.4E-02	4.7E-02	--	--	2.4E-02	4.7E-02	--	--	2.4E-02	4.7E-02
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	5.1E+02	6.0E+03	--	--	5.1E+01	6.0E+02	--	--	5.1E+01	6.0E+02	--	--	5.1E+01	6.0E+02
Total dissolved solids	0	--	--	5.0E+05	--	--	--	5.0E+05	--	--	--	5.0E+04	--	--	--	5.0E+04	--	--	--	5.0E+04	--
Toxaphene ^C	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	7.3E-01	2.0E-04	2.8E-03	2.8E-03	1.8E-01	5.0E-05	2.8E-04	2.8E-04	1.8E-01	5.0E-05	2.8E-04	2.8E-04	1.8E-01	5.0E-05	2.8E-04	2.8E-04
Tributyltin	0	4.6E-01	7.2E-02	--	--	4.6E-01	7.2E-02	--	--	1.2E-01	1.8E-02	--	--	1.2E-01	1.8E-02	--	--	1.2E-01	1.8E-02	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.5E+01	7.0E+01	--	--	3.5E+00	7.0E+00	--	--	3.5E+00	7.0E+00	--	--	3.5E+00	7.0E+00
1,1,2-Trichloroethane ^C	0	--	--	5.9E+00	1.6E+02	--	--	5.9E+00	1.6E+02	--	--	5.9E-01	1.6E+01	--	--	5.9E-01	1.6E+01	--	--	5.9E-01	1.6E+01
Trichloroethylene ^C	0	--	--	2.5E+01	3.0E+02	--	--	2.5E+01	3.0E+02	--	--	2.5E+00	3.0E+01	--	--	2.5E+00	3.0E+01	--	--	2.5E+00	3.0E+01
2,4,6-Trichlorophenol ^C	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+01	2.4E+01	--	--	1.4E+00	2.4E+00	--	--	1.4E+00	2.4E+00	--	--	1.4E+00	2.4E+00
2-(2,4,5-Trichlorophenoxy) acetic acid (Silvex)	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	5.0E+00	--	--	--	5.0E+00	--	--	--	5.0E+00	--
Vinyl Chloride ^C	0	--	--	2.5E-01	2.4E+01	--	--	2.5E-01	2.4E+01	--	--	2.5E-02	2.4E+00	--	--	2.5E-02	2.4E+00	--	--	2.5E-02	2.4E+00
Zinc	0	3.6E+01	3.6E+01	7.4E+03	2.6E+04	3.6E+01	3.6E+01	7.4E+03	2.6E+04	9.1E+00	9.1E+00	7.4E+02	2.6E+03	9.1E+00	9.1E+00	7.4E+02	2.6E+03	9.1E+00	9.1E+00	7.4E+02	2.6E+03

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and
Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	5.6E-01
Arsenic	1.0E+00
Barium	2.0E+02
Cadmium	5.7E-02
Chromium III	3.6E+00
Chromium VI	1.6E+00
Copper	3.6E-01
Iron	3.0E+01
Lead	3.5E-01
Manganese	5.0E+00
Mercury	1.2E-01
Nickel	9.4E-01
Selenium	7.5E-01
Silver	3.2E-02
Zinc	3.6E+00

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Facility = Abel Lake WTP (VA0057487)

Chemical = Chlorine

Chronic averaging period = 4

WLAa = 0.00475

WLAc =

Q.L. = 0.1

samples/mo. = 28

samples/wk. = 7

Summary of Statistics:

observations = 1

Expected Value = .2

Variance = .0144

C.V. = 0.6

97th percentile daily values = .486683

97th percentile 4 day average = .332758

97th percentile 30 day average = .241210

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity

Maximum Daily Limit = 0.00475

Average Weekly limit = 2.90085923207213E-03

Average Monthly Limit = 2.36831754613468E-03

The data are:

0.2

1/8/2014 7:56:04 AM

Facility = Abel Lake WTP
Chemical = Nickel
Chronic averaging period = 4
WLAa = 14
WLAc = 1.6
Q.L. = 0.5
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 2.72
Variance = 2.66342
C.V. = 0.6
97th percentile daily values = 6.61889
97th percentile 4 day average = 4.52550
97th percentile 30 day average = 3.28046
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 2.34011965448517
Average Weekly limit = 2.34011965448517
Average Monthly Limit = 2.34011965448517

The data are:

2.72

1/8/2014 7:43:57 AM

Facility = Abel Lake WTP
Chemical = Copper
Chronic averaging period = 4
WLAa = 0.91
WLAc = 0.68
Q.L. = 0.5
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 5.11
Variance = 9.40035
C.V. = 0.6
97th percentile daily values = 12.4347
97th percentile 4 day average = 8.50196
97th percentile 30 day average = 6.16293
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 0.91
Average Weekly limit = 0.91
Average Monthly Limit = 0.91

The data are:

5.11

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Regional Office

13901 Crown Court

Woodbridge, VA 22193

(703) 583-3800

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Abel Lake Water Treatment Plant (VA0057487)
REVIEWER: Douglas Frasier
DATE: 30 December 2013

PREVIOUS REVIEW: 12 October 2012

DATA REVIEWED:

This review covers acute and chronic toxicity tests conducted in September 2013 at Outfall 001.

DISCUSSION:

The results of the acute and chronic toxicity test along with the results of all previous toxicity tests conducted since 1992 on effluent samples collected from Outfall 001 are summarized in Table 1.

The acute toxicity of the effluent samples was determined with the 48-hour static acute toxicity test using *C. dubia* as the test species. The chronic toxicity of the effluent samples was determined with the 7-day larval survival and growth chronic toxicity test using *P. promelas* as the test species.

The acute toxicity test yielded a LC_{50} of 100% effluent; thus, passing the acute toxicity criterion. Chronic toxicity test yielded a No Observed Effect Concentration (NOEC) of 100%; passing the chronic toxicity criteria.

CONCLUSION:

The chronic and acute toxicity tests are valid and the results are acceptable. The test results indicate that the effluent samples from Outfall 001 exhibit no acute and chronic toxicity to the test species *C. dubia* or *P. promelas*, respectively.

BIOMONITORING RESULTS
Abel Lake Water Treatment Plant (VA0057487)

Table 1
Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	48-hr LC ₅₀ (%)	IC ₂₅ (%)	NOEC (%)	SURV (%)	TU _a	TU _c	REMARKS
11/03/92	Acute <i>C. dubia</i>	>100			100			1st quarterly
11/03/92	Acute <i>P. promelas</i>	>100			100			
10/29/92	Chronic <i>C. dubia</i>			100 SR	90			
10/29/92	Chronic <i>P. promelas</i>			100 SG	68			
01/20/93	Acute <i>C. dubia</i>	44			0			2nd quarterly
01/20/93	Acute <i>P. promelas</i>	68			0			
01/18/93	Chronic <i>C. dubia</i>			INV				
01/18/93	Chronic <i>P. promelas</i>			INV				
02/03/93	Acute <i>C. dubia</i>	37			0			
02/03/93	Acute <i>P. promelas</i>	71			0			
02/02/93	Chronic <i>C. dubia</i>			50 SR	0			
02/01/93	Chronic <i>P. promelas</i>			50 SG	0			
04/28/93	Acute <i>C. dubia</i>	>100			95			3rd quarterly
04/28/93	Acute <i>P. promelas</i>	>100			100			
04/26/93	Chronic <i>C. dubia</i>			100 SR	100			
04/26/93	Chronic <i>P. promelas</i>			100 SG	100			
06/07/93	Acute <i>C. dubia</i>	>100			100			4th quarterly
06/07/93	Acute <i>P. promelas</i>	>100			100			
06/09/93	Acute <i>C. dubia</i>	>100			100			
06/09/93	Acute <i>P. promelas</i>	>100			100			
06/17/93	Acute <i>C. dubia</i>	>100			100			
06/17/93	Acute <i>P. promelas</i>	>100			100			
07/22/93	Acute <i>C. dubia</i>	>100			100			
07/22/93	Acute <i>P. promelas</i>	>100			100			
07/19/93	Chronic <i>C. dubia</i>			100 SR	100			
07/19/93	Chronic <i>P. promelas</i>			100 SG	98			
10/21/93	Acute <i>C. dubia</i>	>100			100			1st annual
10/19/93	Chronic <i>C. dubia</i>			100 SR	100			
08/25/94	Acute <i>C. dubia</i>	>100			100			2nd annual
08/23/94	Chronic <i>C. dubia</i>			100 SR	90			
10/17/95	Acute <i>C. dubia</i>	>100			85			3rd annual
10/12/95	Chronic <i>P. promelas</i>			100 SG	98			
10/31/96	Acute <i>C. dubia</i>	>100			65			4th annual
10/29/96	Chronic <i>P. promelas</i>			12.5 G	92			
10/22/97	Acute <i>C. dubia</i>	73.5			10			5th annual
10/20/97	Chronic <i>P. promelas</i>			51 SG	60			
Permit reissued December 17, 1997								
4/8/98	Acute <i>C. dubia</i>	>100			100			1st annual
4/6/98	Chronic <i>P. promelas</i>			100 SG	100			
4/14/99	Acute <i>C. dubia</i>	>100			100			2nd annual
4/12/99	Chronic <i>P. promelas</i>			100 SG	97.5			

TEST DATE	TEST TYPE/ORGANISM	48-hr LC ₅₀ (%)	IC ₂₅ (%)	NOEC (%)	SURV (%)	TU _s	TU _c	REMARKS
3/15/00	Acute <i>C. dubia</i>	>100	>100		100			3rd annual
3/13/00	Chronic <i>P. promelas</i>			100 SG	90			
3/14/01	Acute <i>C. dubia</i>	>100			95			4th annual
3/12/01	Chronic <i>P. promelas</i>	>100	>100	100 SG	97.5			
3/13/02	Acute <i>C. dubia</i>	>100			100			5th annual
3/11/02	Chronic <i>P. promelas</i>	>100	>100	100 SG	00			
Permit Reissued January 7, 2003								
3/19/03	Acute <i>C. dubia</i>	>100			100	<1		1st annual
3/17/03	Chronic <i>P. promelas</i>	>100	>100	100 SG	87.5		1	
*6/09/04	Acute <i>C. dubia</i>	>100			100	<1		2nd annual
*6/07/04	Chronic <i>P. promelas</i>	>100	>100	100 SG	92.5		1	
*6/15/05	Acute <i>C. dubia</i>	>100			100	<1		3rd annual
*6/13/05	Chronic <i>P. promelas</i>	>100	>100	100 SG	90		1	
3/22/06	Acute <i>C. dubia</i>	>100			90	<1		
3/20/06	Chronic <i>P. promelas</i>	>100	>100	100 SG	90		1	
5/23/07	Acute <i>C. dubia</i>	73.8				1.36		
5/21/07	Chronic <i>P. promelas</i>	72.4	62.5	50 SG			2	
6/14/07	Acute <i>C. dubia</i>	>100				<1		
6/11/07	Chronic <i>P. promelas</i>	100	>100	100 SG			1	
Permit Reissued 14 March 2008								
6/10/09	Acute <i>C. dubia</i>	> 100			100	< 1		1 st annual
6/08/09	Chronic <i>P. promelas</i>	> 100	> 100	100 SG	92.5		1	
9/22/10	Acute <i>C. dubia</i>	> 100			100	< 1		2 nd annual
9/20/10	Chronic <i>P. promelas</i>	> 100	> 100	100 SG	95		1	
12/15/11	Acute <i>C. dubia</i>	39.7			0	2.52		3 rd annual
12/13/11	Chronic <i>P. promelas</i>	70.7	60.1	50 SG	100		2	
01/11/12	Acute <i>C. dubia</i>	>100			100	<1		Retest
12/13/11	Chronic <i>P. promelas</i>	>100	>100	100 SG	100		1	
09/26/12	Acute <i>C. dubia</i>	>100			100	<1		4 th annual
09/24/12	Chronic <i>P. promelas</i>	>100	>100	100 SG	100		1	
09/17/13	Acute <i>C. dubia</i>	>100			100	<1		Extra test
09/17/13	Chronic <i>P. promelas</i>	>100	>100	100 SG	100		1	

ABBREVIATIONS:

S - Survival; R - Reproduction; G - Growth
 % SURV - Percent survival in 100% effluent
 INV - Invalid

To: D. Frasier

STAFFORD *Virginia*

Board of Supervisors

Susan B. Stimpson, Chairman
Robert "Bob" Thomas, Jr., Vice Chairman
Jack R. Cavalier
Paul V. Milde, III
Ty A. Schieber
Gary F. Snellings
Cord A. Sterling

Anthony J. Romanello, ICMA-CM
County Administrator

November 15, 2013

Compliance Auditor
Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, Virginia 22193



SUBJECT: Abel Lake Water Treatment Facility
Annual Toxicity Analyses Report 2013

Dear Ms. Biller:

Enclosed are two (2) copies each, of the annual biological toxicity monitoring for the Abel Lake Water Treatment Facility, Outfall 001 as defined in permit # 0057487.

If you need additional information, please contact Matt Sauter, Plant Manager, at (540) 658-5112.

Sincerely,

A handwritten signature in cursive script, appearing to read "J. Spencer".

Janet L. Spencer
Deputy Director
Stafford County Utilities

JLS:mls
Enclosures





James R. Reed & Associates

Environmental Testing

770 Pilot House Drive • Newport News, Virginia 23606
(757) 873-4703 • Fax 873-1498

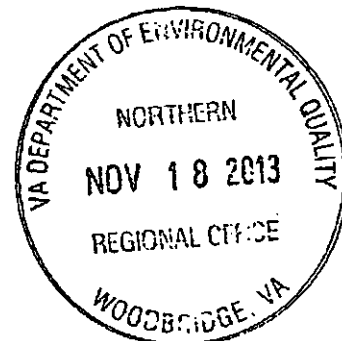
Memorandum

Date: October 7, 2013

To: Matt Sauter, Abel Lake Water Treatment Plant

From: Lei Dong, James R. Reed & Associates

Subject: Outfall 001



Attached please find the bioassay report for outfall 001. The results passed the requirement of your permit for:

Chronic *P.promelas* Toxicity Test

NOEC=100% effluent (TUc=1)

Acute *C.dubia* Toxicity Test

LC50>100% effluent (TUa<1)

If you have any questions and comments, please call me.



October 7, 2013

Abel Lake Water Treatment Plant
Sample ID: Outfall 001
NPDES#: VA0057487
JRA ID: 13-14329

Performed for:

Matt Sauter
Abel Lake Water Treatment Plant
P.O. Box 339
Stafford, VA 22554

Performed by:

James R. Reed & Associates
770 Pilot House Drive
Newport News, VA 23606

Respectfully,

Elaine Claiborne
Elaine Claiborne
Laboratory Director

Reproduction of this report is not permitted, except in full, without written approval from James R. Reed & Associates.
The results of this report relate only to the sample(s) provided for analysis.
Results conform to NELAC standards, where applicable, unless otherwise indicated.

VELAP# 460013
EPA# VA00015



TEST SUMMARY SHEET
(For Marine and Freshwater Tests)
Test Method: EPA 1000.0

Facility: Abel Lake Water Treatment Plant NPDES Permit #: VA0057487
Outfall/Receiving Stream: Outfall 001 JRA #: 13-14329
Test Period for Which Data is Being Submitted: Annual test
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start: Date 9/17/2013 Time 0900
Test End: 9/24/2013 1000
Test Type (chronic/acute): Chronic
Test Organism: Pimephales promelas Age: 24-48 hours
Test Chamber Size: 500 mL
Volume of Test Solution per Chamber: 250 mL
Diluent: 20% DMW
Test Chamber Aeration Period None
Test Photoperiod: 16 hrs light / 8 hrs dark (50-100 ft-c)
Feeding Regime: 0.15mL less than 24-h old brine shrimp nauplii twice daily
Artemia Batch #: BS15938

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u><0.02</u>	<u><0.02</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u><1</u>	<u>N/A</u>
Adjusted	<u>N/A</u>	
3. <u>pH</u>		
Initial	<u>6.78-7.42</u>	<u>7.47-8.28</u>
Adjusted	<u>N/A</u>	

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>12-14</u>	<u>61-64</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>36-47</u>	<u>80-83</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>185-198</u>	<u>171-176</u>
8. <u>DO (mg/L)</u>	<u>5.2-8.3</u>	<u>5.7-8.2</u>

9. Methods Used for Adjustment of Test Solutions

Chlorine	<u>N/A</u>
Salinity	<u>N/A</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100%</u>
Average Weight per Control Organism (mg)	<u>0.962</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival:	<u>Steel's Many-One Rank Test</u>
Growth:	<u>Dunnett's Test</u>
IC25	<u>Linear Interpolation</u>
LC50(@48 hours)	<u>Visual observation</u>

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50 (@ 48 hours)		>100%		
TUa		<1		
IC25		>100%		
Survival	(NOEC)	100%	(LOEC)	>100%
Normal Distribution (yes/no)		yes		
Homogeneous Variance (yes/no)		n/a		
Growth or Reproduction	(NOEC)	100%	(LOEC)	>100%
Normal Distribution (yes/no)		yes		
Homogeneous Variance (yes/no)		yes		
TUc		1		
PMSD		5.56%		
Reference Toxicant Test Date		9/17/2013		
ID No.		T00302		
Result (mg/L)		0.02		
QC Range (mg/L)		0.01	thru	0.04

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	VWR	SB21	00005173	F2
DO meter	YSI	5000	97JO177	N
SCT meter	Orion	3 star	000642	A1
Temperature	VWR	digi-thermo	130199043	N/A
Chlorine	HACH	Colorimeter TM II	00000994	N/A

5. Protocol Deviations/Comments

**EFFLUENT USE SHEET
(CHRONIC RENEWALS)**

Facility: Abel Lake Water Treatment Plant VPDES Permit #: VA0057487

Outfall/Receiving Stream: Outfall 001 JRA #: 13-14329

Test/Organism: Chronic *Pimephales promelas*

SAMPLE COLLECTION						
Date(s)		Time(s)		SAMPLE USE		
From:	To:	From:	To:	Date(s)	Time(s)	Test Day
9/15/2013	9/16/2013	0800	0600	9/17/2013	0900	0
				9/18/2013	0930	1
9/17/2013	9/18/2013	0800	0600	9/19/2013	1015	2
				9/20/2013	0930	3
9/19/2013	9/20/2013	0800	0600	9/21/2013	0945	4
				9/22/2013	0930	5
				9/23/2013	0930	6

The first use of a sample must be within 36-hours of retrieval from the sample collection device.
Last use of sample must be within 72 hours of first use.

TEST SUMMARY SHEET
(For Marine and Freshwater Tests)
Test Method: EPA 2002.0

Facility: Abel Lake Water Treatment Plant NPDES Permit #: VA0057487
Outfall/Receiving Stream: Outfall 001 JRA #: 13-14329
Test Period for Which Data is Being Submitted: Annual test
(i.e., first quarter, semiannual, or annual)

SUMMARY OF TEST CONDITIONS

Test Start:	Date <u>9/18/2013</u>	Time <u>1230</u>
Test End:	<u>9/20/2013</u>	<u>1140</u>
Test Type (chronic/acute):	<u>Acute</u>	
Test Organism:	<u>Ceriodaphnia dubia</u>	Age: <u><24 hours</u>
Test Chamber Size:	<u>30 mL</u>	
Volume of Test Solution per Chamber:	<u>20 mL</u>	
Diluent:	<u>20% DMW</u>	
Test Chamber aeration Period	<u>None</u>	
Test Photoperiod:	<u>16 hrs light / 8 hrs dark(50-100 ft-c)</u>	

RANGE OF CHEMICAL PARAMETERS

Parameter	Effluent	Diluent
1. <u>Chlorine (mg/L)</u>		
Initial	<u><0.02</u>	<u><0.02</u>
Adjusted	<u>N/A</u>	
2. <u>Salinity (ppt)</u>		
Initial	<u><1</u>	<u>N/A</u>
Adjusted	<u>N/A</u>	
3. <u>pH</u>		
Initial	<u>7.09-7.57</u>	<u>8.21-8.26</u>
Adjusted	<u>N/A</u>	

JRA #: 13-14329 Test Type&Organism: Acute Ceriodaphnia dubia

RANGE OF CHEMICAL PARAMETERS (Continued):

Parameter	Effluent	Diluent
4. <u>Alkalinity (mg/L as CaCO₃)</u>	<u>14</u>	<u>61</u>
5. <u>Ammonia (mg/L)</u>	<u>N/A</u>	<u>N/A</u>
6. <u>Hardness (mg/L as CaCO₃)</u>	<u>36</u>	<u>80</u>
7. <u>Conductivity (µmhos/cm)</u>	<u>195-197</u>	<u>174-177</u>
8. <u>DO (mg/L)</u>	<u>8.0-8.3</u>	<u>8.0-8.3</u>
9. <u>Methods Used for Adjustment of Test Solutions</u>		

Chlorine	<u>N/A</u>
Salinity	<u>N/A</u>
pH	<u>N/A</u>

TEST RESULTS

1. Test Acceptability

Control Survival (%)	<u>100%</u>
Average Weight per Control Organism (mg)	<u>N/A</u>
Average Number of Young per Control (<i>C. dubia</i>)	<u>N/A</u>
60% of Control Females (<i>C. dubia</i>) with 3 Broods?	<u>N/A</u>
Total Number of Male <i>C. dubia</i> in the Test	<u>N/A</u>
Known Parentage? <u>N/A</u>	
Percent Females Producing Eggs (<i>M. bahia</i>)	<u>N/A</u>

2. Method(s) of Statistical Analyses

Survival: Visual observation
Growth/Reproduction: N/A

JRA #: 13-14329

Test Type&Organism: Acute *Ceriodaphnia dubia*

TEST RESULTS (Continued)

3. Statistical Results (as appropriate)

LC50			>100%
			TUa<1
Survival	(NOEC)	N/A	(LOEC) N/A
	Normal Distribution (yes/no)	N/A	
	Homogeneous Variance (yes/no)	N/A	
Growth or Reproduction	(NOEC)	N/A	(LOEC) N/A
	Normal Distribution (yes/no)	N/A	
	Homogeneous Variance (yes/no)	N/A	
Reference Toxicant Test Date		9/5/2013	
ID No.		T00300	
Result (mg/L)		0.06	
QC Range (mg/L)		0.05	thru 0.08

4. Equipment

	(Make	Model	Serial #	Probe #)
pH meter	VWR	SB21	00005173	F2
DO meter	YSI	5000	97J0177	N
SCT meter	Orion	3 Star	000642	A1
Temperature	VWR	digi-thermo	130199043	N/A
Chlorine	HACH	Colorimeter™II	00000994	N/A

5. Protocol Deviations/Comments

CUMULATIVE DATA SUMMARY

Abel Lake Water Treatment Plant

NPDES: VA0057487

Outfall 001

Date of Test	Vertebrate LC50 %	Invertebrate LC50 %	Vertebrate NOEC %	Invertebrate NOEC %
10/29/1992			100	100
11/03/92	>100	>100		
01/20/93	68	44	INVALID	INVALID
02/01/93			50	
02/02/93				50
02/03/93	71	37		
04/26/93			100	100
04/28/93	>100	>100		
06/07/93	>100	>100		
06/09/93	>100	>100		
06/17/93	>100	>100		
07/19/93			100	100
07/22/93	>100	>100		
10/19/93				100
10/21/93		>100		
08/23/94				100
08/25/94		>100		
10/12/95			100	
10/17/95		>100		
10/29/1996			12.5	
10/31/1996		>100		
10/97			51	
10/97		73.5		
4/6/98			100	
4/8/98		>100		
4/12/1999			100	
4/14/99		>100		
3/13/00			100	
3/15/00		>100		
3/12/01			100	
3/14/01		>100		
3/11/02			100	
3/13/02		>100		
3/17/2003			100	
3/19/03		>100		

CUMULATIVE DATA SUMMARY

Abel Lake Water Treatment Plant

NPDES: VA0057487

Outfall 001

Date of Test	Vertebrate LC50 %	Invertebrate LC50 %	Vertebrate NOEC %	Invertebrate NOEC %
6/7/2004			100 TUc=1	
6/9/2004		>100 TUa<1		
6/13/2005			100 TUc=1	
6/15/2005		>100 TUa<1		
3/20/2006			100 TUc=1	
3/22/2006		>100 TUa<1		
5/21/2007			50 TUc=2	
5/23/2007		73.8 TUa=1.36		
6/11/2007			100* TUc=1	
6/14/2007		>100%* TUa<1		
4/7/2008			100 TUc=1	
4/9/2008		85.2% TUa=1.17		
4/28/2008		>100%* TUa<1		
6/8/2009			100 TUc=1	
6/10/2009		>100 TUa<1		
9/20/2010			100 TUc=1	
9/22/2010		>100 TUa<1		
12/13/2011			50 TUc=2	
12/15/2011		39.7% TUa=2.52		
1/10/2012			100 TUc=1	
1/11/2012		>100 TUa<1		
9/24/2012			100 TUc=1	
9/26/2012		>100 TUa<1		
9/17/2013			100 TUc=1	
9/18/2013		>100 TUa<1		

* repeat test



OBSERVATIONS

NPDES#: VA0057487 CLIENT: Stafford-Abel Lake

OUTFALL: 001

9/15/13

ORGANISM SOURCE: Chesapeake Cultures JRA BATCH #: P485 HATCH DATE: 1430-1530

NUMBER SURVIVING/DAY									
CONC	REP	DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Control	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
6.25%	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
12.5%	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
25%	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
71.25% 10% 13/12	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
100%	A	10	10	10	10	10	10	10	10
	B	10	10	10	10	10	10	10	10
	C	10	10	10	10	10	10	10	10
	D	10	10	10	10	10	10	10	10
\bar{x} surv 100 %									
DATE 2013		9/17	9/18	9/19	9/20	9/21	9/22	9/23	9/24
TIME		0900	0930	1015	0930	0945	0930	0930	1000
INT		LD	RM	LD	RM	RM	RM	RM	RM

Chronic P.promelas Survival and Growth Test

JRA: 13-14329

NPDS#

CLIENT: Stafford-Able Lake

OUTFALL# 001

VA0057487

GROWTH DATA

CONC.	REP	FOIL#	FOIL WT(mg)	FOIL WT&ORG WT(mg)	WT OF ORGS(mg)	#ORGS	MEAN		
	A	1H	4.349	14.350	10.001	10	1.000		
	B	2H	5.591	15.176	9.585	10	0.959		
Control	C	3H	5.000	13.935	8.935	10	0.894	Ave. wt of surviving	
	D	4H	5.318	15.270	9.952	10	0.995	Control: (mg)	0.962
								ave. wt :	0.962
	A	5H	4.261	13.564	9.303	10	0.930		
	B	6H	4.987	14.480	9.493	10	0.949		
6.25%	C	7H	4.143	13.263	9.120	10	0.912		
	D	8H	4.685	13.648	8.963	10	0.896		
								ave. wt :	0.922
	A	9H	4.830	14.022	9.192	10	0.919		
	B	10H	4.721	13.912	9.191	10	0.919		
12.5%	C	11H	4.715	14.300	9.585	10	0.959		
	D	12H	4.739	14.120	9.381	10	0.938		
								ave. wt :	0.934
	A	13H	4.292	13.693	9.401	10	0.940		
	B	14H	4.642	13.680	9.038	10	0.904		
25%	C	15H	5.178	14.339	9.161	10	0.916		
	D	16H	4.731	13.731	9.000	10	0.900		
								ave. wt :	0.915
	A	17H	4.836	13.942	9.106	10	0.911		
	B	18H	4.981	14.422	9.441	10	0.944		
71%	C	19H	5.090	13.967	8.877	10	0.888		
	D	20H	5.050	14.438	9.388	10	0.939		
								ave. wt :	0.920
	A	21H	4.421	14.014	9.593	10	0.959		
100%	B	22H	5.384	15.550	10.166	10	1.017		
	C	23H	4.733	14.665	9.932	10	0.993		
	D	24H	5.450	15.989	10.539	10	1.054		
								ave. wt :	1.006
Date			9/19/2013	9/25/2013					
Initials			LD	KH					

Date/Time in Oven: 9/24/13@1205

Analyst KH

Oven Temp°C 104

Date/Time out of Oven: 9/25/13@0800

Analyst KH

Oven Temp°C 104



Chronic *Pimephales promelas* Larval Survival and Growth Test

JRA# 13-14329

GENERAL COMMENTS

NPDES#: VA0057487 CLIENT: Stafford-Able Lake OUTFALL: 001

FEEDINGS	DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6
DATE/TIME		9/18/13 @ 745	9/19/13 @ 0905	9/20/13 @ 745	9/21/13 @ 740	9/22/13 @ 740	9/23/13 @ 745
INITIALS		km	cy	km	km	km	km
Date/TIME	9/17/13 1330	9/18/13 @ 1250	9/19/13 @ 1500	9/20/13 @ 1215	9/21/13 @ 1250	9/22/13 @ 1320	9/23/13 @ 1300
INITIALS	cy	km	km	km	km	km	cy

TREATMENT PREPARATIONS CALCULATIONS							Verification of:	Verified by:	ANALYST SIGNATURES	INITIALS
Conc. (% mg/L) (circle one)	Total Volume (mL)	Stock Conc. (% mg/L)	Amount Stock (mL)	Amount Diluent (mL)	Hard (mg/L)	ALK (mg/L)	Treatment Preparation Calculations		I-273 kerl km	km
Control	1000	DNA 100% cy	0	1000	80-83	601-64	Number of Organisms	cy		
6.25%	1000	100%	62.5	937.5			Statistical Analyses	cy		
12.5%	1000	100%	125	875			Statistical Analyses	cy		
25%	1000	100%	250	750						
50% 71% 43m	1000	100%	710 500 500	290 500 500						
100%	1000	100%	1000	0	36-47	1274				
Stock Solution										

TEST CHAMBER SIZE: 500mL

TYPE:

Polystyrene

VOLUME OF TEST SOLUTION: 250mL

COMMENTS:



PHYSICAL/CHEMICAL DATA

NPDES# VA0057487 CLIENT: Stafford-Able Lake OUTFALL: OUTFALL: 001

CONC: Control		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.8	25.0	24.8	25.1	25.3	25.2	25.0	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	8.28	8.24	8.20	8.26	8.17	8.25	8.24	N/A
	END	N/A	7.59	7.57	7.61	7.47	7.68	7.60	7.64
DO (mg/L)	NEW	8.1	8.0	8.1	8.0	8.2	8.2	8.2	N/A
	END	N/A	6.0	5.7	6.7	6.5	6.9	6.3	6.7
COND (µmhos/cm)		171	174	173	172	176	176	175	N/A
DATE		9/17/13	9/18/13	9/19/13	9/20/13	9/21/13	9/22/13	9/23/13	9/24/13
INITIALS		IC	KM	LM	IC	KM	KM	IC	IC

CONC: 6.25%		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.3	24.3	25.4	24.1	25.0	25.1	25.0	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	8.24	8.21	8.48	8.25	8.19	8.25	8.26	N/A
	END	N/A	7.51	7.58	7.62	7.42	7.59	7.43	7.52
DO (mg/L)	NEW	8.2	8.1	7.8	8.1	8.2	8.0	8.3	N/A
	END	N/A	5.6	5.9	6.8	6.2	6.5	5.1	6.2
COND (µmhos/cm)		172	174	173	171	177	177	177	N/A

CONC: 12.5%		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.5	24.7	25.3	24.3	25.3	25.2	25.1	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	8.24	8.21	8.18	8.24	8.17	8.26	8.25	N/A
	END	N/A	7.57	7.53	7.58	7.47	7.47	7.40	7.55
DO (mg/L)	NEW	8.1	8.0	8.1	8.2	8.2	8.0	8.3	N/A
	END	N/A	6.1	5.7	6.8	5.8	6.3	5.1	6.4
COND (µmhos/cm)		173	175	174	172	178	178	178	N/A

(Indicate comments with an * and document on General Comments page)

Rev. 10/19/00

Chronic *Pimephales promelas* Larval Survival and Growth Test

JRA# 13-14329

PHYSICAL/CHEMICAL DATA

NPDES#: VA0057487 CLIENT: Stafford-Abel Lake OUTFALL: 001

CONC: 25%		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.7	24.9	25.3	24.5	25.1	25.3	25.1	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	8.17	8.18	8.11	8.21	8.13	8.20	8.20	N/A
	END	N/A	7.47	7.48	7.54	7.37	7.40	7.35	7.47
DO (mg/L)	NEW	8.1	7.9	8.0	8.2	8.3	8.0	8.2	N/A
	END	N/A	5.8	5.7	6.7	5.5	5.7	5.1	6.2
COND (µmhos/cm)		174	176	177	175	179	179	179	N/A
DATE		9/17/03	9/18/03	9/19/03	9/20/03	9/21/03	9/22/03	9/23/03	9/24/03
INITIALS		km	km	vd	km	km	km	km	km

CONC: 50% 71% 59/111		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.6	24.9	24.7	24.8	25.4	25.3	25.2	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	7.74	7.87	7.73	7.88	7.75	7.89	7.85	N/A
	END	N/A	7.26	7.24	7.32	7.09	7.22	7.26	7.19
DO (mg/L)	NEW	8.2	8.0	8.1	8.2	8.2	8.0	8.3	N/A
	END	N/A	6.1	5.9	6.9	5.1	5.6	5.8	6.3
COND (µmhos/cm)		178	180	186	187	183	183	183	N/A

CONC: 100%		DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
TEMP (°C)	NEW	24.6	24.7	25.6	25.1	25.3	25.1	25.2	N/A
	END	N/A	24.9	24.8	24.9	24.9	24.9	24.8	24.8
pH	NEW	7.09	7.17	7.29	7.42	7.08	7.31	7.20	N/A
	END	N/A	6.91	6.80	6.92	6.81	6.83	6.80	6.78
DO (mg/L)	NEW	8.3	8.1	8.3	8.1	8.3	8.1	8.3	N/A
	END	N/A	6.3	5.5	6.5	5.2	6.2	5.8	6.2
COND (µmhos/cm)		185	185	198	197	188	187	188	N/A

(Indicate comments with an * and document on General Comments page)

Rev. 10/19/00

Chronic *Pimephales promelas* Larval Survival and Growth Test

JRA# 13-143929

WATER QUALITY

9/23/13

NPDES#: VA0057487 CLIENT: Stafford-Able Lake OUTFALL: 001

SAMPLE (PRIOR TO RENEWALS)													
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	INIT pH	FINAL pH (6-9)	INIT DO (mg/L)	FINAL DO (mg/L)	COND (µmhos)	INIT TRC (mg/L)	FINAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
9/17/13	0	9/15/13 0800 9/16/13 0600	9/16/13	24.6	6.48	7.09	10.7	8.3	185	<0.02	—	47	14
9/18/13	1	"	"	24.7	6.54	7.17	11.5	8.1	185	<0.02	—	47	14
9/19/13	2	9/17/13 0800 9/18/13 0600	9/18/13	25.6	6.60	7.29	11.2	8.3	198	<0.02	—	36	14
9/20/13	3	"	"	25.1	6.71	7.42	11.7	8.1	197	<0.02	—	36	14
9/21/13	4	9/19/13 0800 9/20/13 0600	9/20/13	25.3	6.40	7.08	11.3	8.3	188	<0.02	—	44	12
9/22/13	5	"	"	25.1	6.44	7.31	11.5	8.1	187	<0.02	—	44	12
9/23/13	6	"	"	25.2	6.46	7.20	12.0	8.3	188	<0.02	—	44	12

DO Adjustments

Date

Method

Minutes

9/17/13	9/18/13	9/19/13	9/20/13	9/21/13	9/22/13	9/23/13
Aerate	Aerate	Aerating	Aerate	Aerate	Aerate	Aerate
15	20	20	20	20	20	20

pH Adjustments

Date

Method

Amount

TRC Adjustments

Date

Method

Amount

DILUENT (<u>DIW</u>) Mod Hard SFW Other _____) CIRCLE ONE									
DATE	DAY	DATE MADE	TEMP (°C)	pH	DO (mg/L)	COND (µmhos)	TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
9/17/13	0	9/14/13	24.8	8.28	8.1	171	<0.02	83	64
9/18/13	1	9/15/13	25.0	8.24	8.0	174	<0.02	80	61
9/19/13	2	9/16/13	24.8	8.20	8.1	173	<0.02	82	62
9/20/13	3	9/16/13	25.1	8.26	8.0	172	<0.02	82	62
9/21/13	4	9/17/13	25.3	8.17	8.2	176	<0.02	83	64
9/22/13	5	9/19/13	25.2	8.25	8.2	176	<0.02	82	63
9/23/13	6	9/19/13	25.0	8.24	8.2	175	<0.02	82	63

Larval Fish Growth and Survival Test-7 Day Survival

Start Date: 9/17/2013 Test ID: 13-14329 Sample ID: VA0057487
 End Date: 9/24/2013 Lab ID: JRR Sample Type: EFF1-POTW
 Sample Date: Protocol: EPA-821-R-02-013 Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4
control	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000
71	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
6.25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
12.5	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
25	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
71	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
100	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00

Auxiliary Tests

Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)

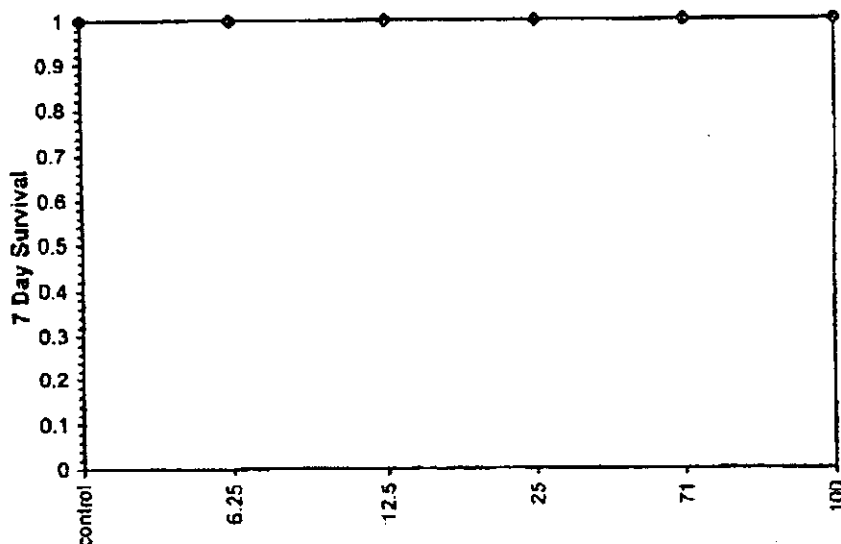
Equality of variance cannot be confirmed

Hypothesis Test (1-tail, 0.05) NOEC LOEC ChV TU

Steel's Many-One Rank Test 100 >100 1

Treatments vs control

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Growth

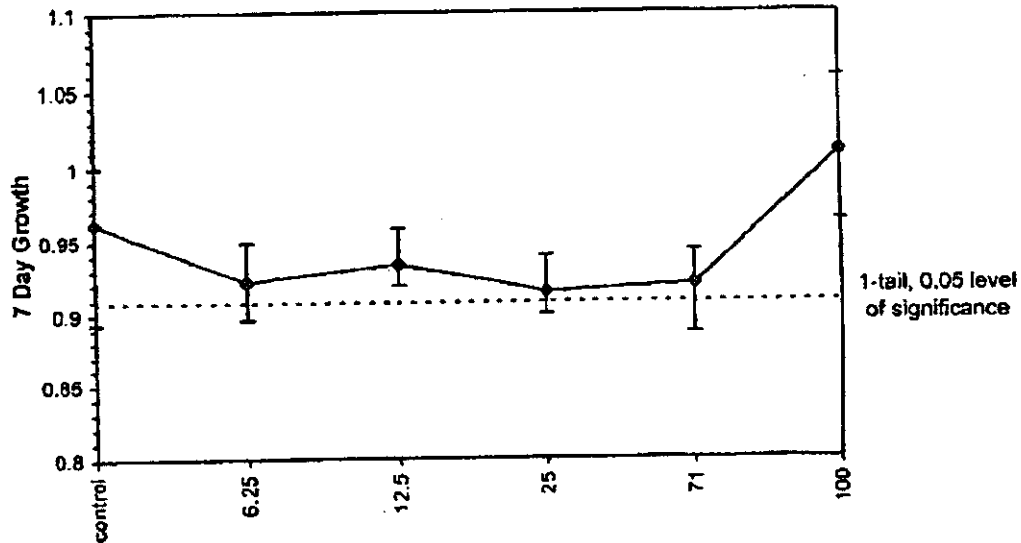
Start Date: 9/17/2013 Test ID: 13-14329 Sample ID: VA0057487
 End Date: 9/24/2013 Lab ID: JRR Sample Type: EFF1-POTW
 Sample Date: Protocol: EPA-821-R-02-013 Test Species: PP-Pimephales promelas
 Comments:

Conc-%	1	2	3	4
control	1.0001	0.9585	0.8935	0.9952
6.25	0.9303	0.9493	0.9120	0.8963
12.5	0.9192	0.9191	0.9585	0.9381
25	0.9401	0.9038	0.9161	0.9000
71	0.8106	0.9441	0.8877	0.9388
100	0.9593	1.0166	0.9932	1.0539

Conc-%	Transform: Untransformed							1-Tailed		
	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
control	0.9618	1.0000	0.9618	0.8935	1.0001	5.114	4			
6.25	0.9220	0.9586	0.9220	0.8963	0.9493	2.485	4	1.798	2.410	0.0534
12.5	0.9337	0.9708	0.9337	0.9191	0.9585	2.011	4	1.268	2.410	0.0534
25	0.9150	0.9513	0.9150	0.9000	0.9401	1.977	4	2.112	2.410	0.0534
71	0.9203	0.9568	0.9203	0.8877	0.9441	2.851	4	1.873	2.410	0.0534
100	1.0058	1.0457	1.0058	0.9593	1.0539	3.957	4	-1.982	2.410	0.0534

Auxiliary Tests					Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)					0.97072	0.916	-0.4616	0.26525						
Bartlett's Test indicates equal variances ($p = 0.47$)					4.59308	15.0863								
Hypothesis Test (1-tail, 0.05)					NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					100	>100		1	0.05342	0.05554	0.0049	0.00098	0.00488	5, 18
Treatments vs control					Dose Response Plot									

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Growth

Start Date: 9/17/2013 Test ID: 13-14329 Sample ID: VA0057487
 End Date: 9/24/2013 Lab ID: JRR Sample Type: EFF1-POTW
 Sample Date: Protocol: EPA-821-R-02-013 Test Species: PP-Pimephales promelas
 Comments:

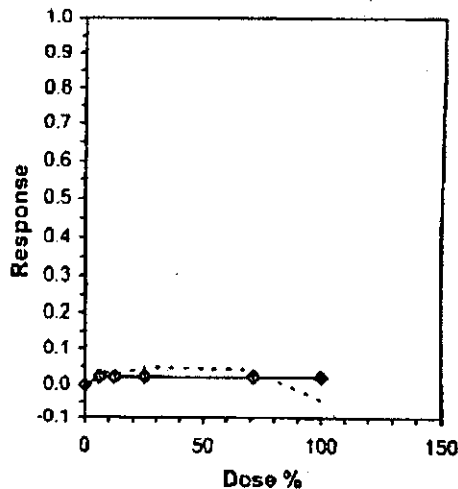
Conc-%	1	2	3	4
control	1.0001	0.9585	0.8935	0.9952
6.25	0.9303	0.9493	0.9120	0.8963
12.5	0.9192	0.9191	0.9585	0.9381
25	0.9401	0.9038	0.9161	0.9000
71	0.9106	0.9441	0.8877	0.9388
100	0.9593	1.0166	0.9932	1.0539

Conc-%	Transform: Untransformed							Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
control	0.9618	1.0000	0.9618	0.8935	1.0001	5.114	4	0.9618	1.0000
6.25	0.9220	0.9586	0.9220	0.8963	0.9493	2.485	4	0.9394	0.9766
12.5	0.9337	0.9708	0.9337	0.9191	0.9585	2.011	4	0.9394	0.9766
25	0.9150	0.9513	0.9150	0.9000	0.9401	1.977	4	0.9394	0.9766
71	0.9203	0.9568	0.9203	0.8877	0.9441	2.851	4	0.9394	0.9766
100	1.0058	1.0457	1.0058	0.9593	1.0539	3.957	4	0.9394	0.9766

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.97072	0.916	-0.4616	0.26525
Bartlett's Test indicates equal variances ($p = 0.47$)	4.59306	15.0863		

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20 ✓	>100 ✓			
IC25 ✓	>100 ✓			
IC40	>100			
IC50	>100			



Test: LF-Larval Fish Growth and Survival Test

Test ID: 13-14329

Species: PP-Pimephales promelas

Protocol: EPA-821-R-02-013

Sample ID: VA0057487

Sample Type: EFF1-POTW

Start Date: 9/17/2013

End Date: 9/24/2013

Lab ID: JRR

Pos	ID	Rep	Group	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Total Wgt	Tare Wgt	Wgt Count
	1	1	control	10	10	10	10	10	10	10	10	14.35	4.349	10
	2	2	control	10	10	10	10	10	10	10	10	15.176	5.591	10
	3	3	control	10	10	10	10	10	10	10	10	13.935	5	10
	4	4	control	10	10	10	10	10	10	10	10	15.27	5.318	10
	5	1	6.25	10	10	10	10	10	10	10	10	13.564	4.261	10
	6	2	6.25	10	10	10	10	10	10	10	10	14.48	4.987	10
	7	3	6.25	10	10	10	10	10	10	10	10	13.263	4.143	10
	8	4	6.25	10	10	10	10	10	10	10	10	13.648	4.685	10
	9	1	12.5	10	10	10	10	10	10	10	10	14.022	4.83	10
	10	2	12.5	10	10	10	10	10	10	10	10	13.912	4.721	10
	11	3	12.5	10	10	10	10	10	10	10	10	14.3	4.715	10
	12	4	12.5	10	10	10	10	10	10	10	10	14.12	4.739	10
	13	1	25	10	10	10	10	10	10	10	10	13.693	4.292	10
	14	2	25	10	10	10	10	10	10	10	10	13.68	4.642	10
	15	3	25	10	10	10	10	10	10	10	10	14.339	5.178	10
	16	4	25	10	10	10	10	10	10	10	10	13.731	4.731	10
	17	1	71	10	10	10	10	10	10	10	10	13.942	4.836	10
	18	2	71	10	10	10	10	10	10	10	10	14.422	4.981	10
	19	3	71	10	10	10	10	10	10	10	10	13.967	5.09	10
	20	4	71	10	10	10	10	10	10	10	10	14.438	5.05	10
	21	1	100	10	10	10	10	10	10	10	10	14.014	4.421	10
	22	2	100	10	10	10	10	10	10	10	10	15.55	5.384	10
	23	3	100	10	10	10	10	10	10	10	10	14.665	4.733	10
	24	4	100	10	10	10	10	10	10	10	10	15.989	5.45	10

Comments:



Acute *Daphnia dubia* Toxicity Test

OBSERVATIONS

JRA# 13-14329

9/17/13 9:1700
9/18/13 1120

NPDES# VA0057487 CLIENT: Stafford-Able Lake OUTFALL: 001

ORGANISM SOURCE: JRA JRA BATCH#: n/a

AGE: <24 hours

Conc % %Surv.	REP ↓	NUMBER OF LIVE ORGANISMS (control >90%)					pH					DISSOLVED OXYGEN (mg/L)					TEMPERATURE					COND (µmhos)	
		0	24	48			0	24	48			0	24	48			0	24	48			0	END
Control	A	5	5	5			8.14	8.26	8.21			8.10	8.3	8.3			25.0	25.1	25.3			174	177
100%	B	5	5	5																			
	C	5	5	5																			
	D	5	5	5																			
6.25	A	5	5	5			8.14	8.26	8.30			8.3	8.3	8.3			24.5	25.1	25.3			176	178
100%	B	5	5	5																			
	C	5	5	5																			
	D	5	5	5																			
12.5	A	5	5	5			8.14	8.23	8.17			8.3	8.2	8.3			24.9	25.1	25.3			178	179
100%	B	5	5	5																			
	C	5	5	5																			
	D	5	5	5																			
25	A	5	5	5			8.06	8.27	8.12			8.3	8.2	8.3			24.8	25.1	25.3			179	181
100%	B	5	5	5																			
	C	5	5	5																			
	D	5	5	5																			
INIT		24	40	100																			
DATE 2008		9/18	9/19	9/20																			
TIME		1230	1430	1440																			

(Indicate comments with an * and document on General Comments page)

Rev 10/10/00



JRA# 13-14329

NPDES#: VA0057487 CLIENT: Stafford-Able Lake OUTFALL: DD 1

(Indicate comments with an * and document on General Comments page)

Rev 10/10/00



NPDES# VA0057487 CLIENT: Stafford-Able Lake OUTFALL: 001

SAMPLE (PRIOR TO ADDITION OF ORGANISMS)													
DATE	DAY	COLLECTION DATE/TIME	ARRIVAL DATE	TEMP (°C)	INIT pH	FINAL pH	INIT DO (mg/L)	FINAL DO (mg/L)	COND (µmhos)	INIT TRC (mg/L)	FINAL TRC (mg/L)	HARD (mg/L)	ALK (mg/L)
9/18/13	0	9/17/13 08:00 9/18/13 08:00	9/18/13	24.9	6.71	7.09	10.3	8.3	195	<0.02	-	36	14

DO Adjustments

Date 9/18/13

Method Deyue

Minutes 10

pH Adjustments

Date

Method

Amount

TRC Adjustments

Date

Method

Amount

DILUENT (<input checked="" type="radio"/> DIW Mod Hard SFW Other) CIRCLE ONE										
20%										
DATE	DAY	DATE MADE	TEMP (°C)	pH	DO (mg/L)	COND (µmhos)	TRC (mg/L) <0.02	HARD (mg/L) 80-100	ALK (mg/L)	
9/18/13	0	9/15/13	25.0	8.24	8.0	174	<0.02	80	61	
TREATMENT PREPARATIONS CALCULATIONS					VERIFICATION OF:	VERIFIED BY:	ANALYST SIGNATURES		INITIALS	
CONC (%) (circle one)	TOTAL VOLUME (mL)	STOCK CONC (%) (circle one)	AMOUNT STOCK (mL)	AMOUNT DILUENT (mL)	TREATMENT PREPARATION CALCULATIONS		 		 	
Control	200	N/A	0	200	NUMBER OF ORGANISMS	6				
6.25%	200	100%	12.5	187.5	STATISTICAL ANALYSES	4				
12.5%	200	100%	25	175						
25%	200	100%	50	150						
50%	200	100%	100	100						
100%	200	100%	200	0						
CALCULATIONS PERFORMED BY: 17										

TEST CHAMBER SIZE: 30mL TYPE: Propylene VOLUME OF TEST SOLUTION: 20mL

EQUIPMENT Make Model Serial Number Probe Number

pH meter YWR SB21 0005173 # E 73

DO meter YSI 5000 9710177 N

SCT meter ORION 3 STAR 000642 AI

Temperature YWR digi-thermo N/A 130199043 N/A

Chlorine HACH Colormeter II 00000294 N/A

COMMENTS:



Toxicity Test Sample Chain of Custody

PLEASE COMPLETE ALL INFORMATION

Facility: ABEL LAKE WATER TREATMENT FACILITY
 NPDES#: VA 0057487
 Address: 121 Moorewood Ln. Fredericksburg, Va. 22406
 County: Stafford Pipe/Outfall/Location: 001
 Flow Type (Circle One) Continuous Intermittent Batch Stormwater Other: _____
 Instream Waste Conc: _____

Type of sample:

(Grab): Date _____ Time _____ Amount of Sample Collected _____

✓ (Time Composite): Collected from (Date/Time): 9-15-13 / 0800

To (Date/Time): 9-16-13 / 0600

Number/Volume of Subsamples: 12 / 850 Time Increment: 2 hrs Total Amount Collected: 10L

(Flow-Proportional Composite): Collected from (Date/Time): _____

To (Date/Time): _____

Set Volume Subsample/Volume Flow: _____ Total Amount Collected: _____

For variable volume subsamples based on flow/set time increments -- Attach sample and flow information.

Sample collected by: (print) _____ Affiliation: _____

(sign) _____

*Temperature of sample in sample collection device 3.5°C

*Final temperature of effluent at sample collection point 25°

*Is sample collection device chilled? yes Is sample packed on ice for shipment? yes

*It is required that all samples remain at 0-6°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? _____ dechlorinated? ✓ If so, how? Sodium Bisulfite

Permit with interim chlorine limit? _____ If yes- limit (mg/L) _____

Field pH 6.4 Field Total Residual Chlorine 0.00 Time: 12:00 Grab time: _____

Name of Analyst: _____ Affiliation: _____

Comments/Sample description Final effluent - out fall 001 as defined in permit #VA0057487

Method of Shipment: Plant Staff

Shipment Date / Time: _____

Type of test(s) to be performed: Acute Toxicity / chronic Toxicity
 (Specify organisms): Ceriodaphnia dubia / prinephales promelas

PRINT & SIGN NAMES

Relinquished by: (Print) M. Saiter / Sign M. Saiter Date/Time 9/16/13 0700

Received by: (Print) Rodger Kenney / Sign Rodger Kenney Date/Time 9/16/13 0700

Relinquished by: (Print) Rodger Kenney / Sign Rodger Kenney Date/Time 9/16/13 10:46

Received by: (Print) Mendy Hall / Sign Mendy Hall Date/Time 9-16-13 10:46

Relinquished by: (Print) _____ / Sign _____ Date/Time _____

Received by: (Print) _____ / Sign _____ Date/Time _____

EFFLUENT CONDITION UPON ARRIVAL AT LABORATORY

IRA #: 181432A Arrival Temperature: 22°C Date: 9-16-13 Time: 12:46 Ice Present: Yes / No

Sample Volume: 2.560L Color: Light yellow Odor: None Solids: None pH: 6.48 DO (mg/L): 10.7

Conductivity (µmhos/cm) 185 @ 24.6 °C Salinity (ppt): 21 TRC (mg/L): 20.02

Method (For TRC): HACH 8167 Analyst: KR



Toxicity Test Sample Chain of Custody

PLEASE COMPLETE ALL INFORMATION

(2)

Facility: ABEL Lake Water Treatment Facility
 NPDES#: VA 0057487
 Address: 121 Moorewood Ln. Fredericksburg, Va. 22406
 County: Stafford Pipe/Outfall/Location: 001
 Flow Type (Circle One) (Continuous) Intermittent Batch Stormwater Other: _____
 Instream Waste Conc _____

Type of sample:

(Grab): Date _____ Time _____ Amount of Sample Collected _____
☒ (Time Composite): Collected from (Date/Time): 9-17-13 / 0800
 To (Date/Time): 9-18-13 / 0600
 Number/Volume of Subsamples: 12 / 850 Time Increment: 2 hrs Total Amount Collected: 10L
 (Flow-Proportional Composite): Collected from (Date/Time): _____
 To (Date/Time): _____

Set Volume Subsample/Volume Flow: _____ Total Amount Collected: _____

For variable volume subsamples based on flow/set time increments -- Attach sample and flow information.

Sample collected by: (print) _____ Affiliation: _____
 (sign) _____

- *Temperature of sample in sample collection device 6°C
- *Final temperature of effluent at sample collection point 28°C
- *Is sample collection device chilled? YES Is sample packed on ice for shipment? YES
- *It is required that all samples remain at 0-6°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? _____ dechlorinated? ✓ If so, how? Sodium Bisulfite

Permit with interim chlorine limit? _____ If yes- limit (mg/L) _____

Field pH 6.5 Field Total Residual Chlorine 0.00 Time: 1600 Grab time: _____

Name of Analyst: _____ Affiliation: _____

Comments/Sample description Final effluent - out fall 001 as defined in permit #VA0057487

Method of Shipment: PLANT STAFF

Shipment Date / Time: _____

Type of test(s) to be performed: ACUTE TOXICITY / CHRONIC TOXICITY
 (Specify organisms): Ceriodaphnia dubia / primephales promelas

PRINT & SIGN NAMES

Relinquished by: (Print) James E. Showers Sr / Sign James E. Showers Date/Time 9-18-13 07:00

Received by: (Print) Rodger Kenney / Sign Rodger Kenney Date/Time 9-18-13 07:00

Relinquished by: (Print) Rodger Kenney / Sign Rodger Kenney Date/Time 9-18-13 10:35

Received by: (Print) Mendy Hall / Sign Mendy Hall Date/Time 9-18-13 10:35

Relinquished by: (Print) _____ / Sign _____ Date/Time _____

Received by: (Print) _____ / Sign _____ Date/Time _____

EFFLUENT CONDITION UPON ARRIVAL AT LABORATORY

JRA #: 1314929-B Arrival Temperature: 0.7 Date: 9-18-13 Time: 10:35 Ice Present: Yes / No
 Sample Volume: 2.5 (6.1) Color: Light Yellow Odor: Some Solids: Some pH: 6.71 DO (mg/L): 10.3
 Conductivity (µmhos/cm) 195 @ 24.9 °C Salinity (ppt): <1 TRC (mg/L): <0.02
 Method (For TRC): HACH 8167 Analyst: Ken



3

Toxicity Test Sample Chain of Custody

PLEASE COMPLETE ALL INFORMATION

Facility: ABEL LAKE WATER TREATMENT FACILITY
 NPDES#: VA 0057487
 Address: 121 Moorewood Ln. Fredericksburg, Va. 22406
 County: Stafford Pipe/Outfall/Location: 001
 Flow Type (Circle One) Continuous Intermittent Batch Stormwater Other: _____
 Instream Waste Conc _____

Type of sample:

(Grab): Date _____ Time _____ Amount of Sample Collected _____
☒ (Time Composite): Collected from (Date/Time): 9-19-13 / 0800
 To (Date/Time): 9-20-13 / 0600
 Number/Volume of Subsamples: 12 / 850 Time Increment: 2 hrs Total Amount Collected: 10L
 (Flow-Proportional Composite): Collected from (Date/Time): _____
 To (Date/Time): _____

Set Volume Subsample/Volume Flow: _____ Total Amount Collected: _____

For variable volume subsamples based on flow/set time increments --Attach sample and flow information.

Sample collected by: (print) _____ Affiliation: _____
 (sign) _____

- *Temperature of sample in sample collection device 4°C
- *Final temperature of effluent at sample collection point 24°C
- *Is sample collection device chilled? yes Is sample packed on ice for shipment? yes
- *It is required that all samples remain at 0-6°C during collection period and shipment for data to be accepted by the appropriate Regulatory Agency (Do not freeze!)

Is the sample chlorinated? _____ dechlorinated? ✓ If so, how? Sodium Bisulfite

Permit with interim chlorine limit? _____ If yes- limit (mg/L) _____

Field pH 6.4 Field Total Residual Chlorine 0.00 Time: 1400 Grab time: _____

Name of Analyst: _____ Affiliation: _____

Comments/Sample description Final effluent-out Fall 001 as defined in permit #VA0057487

Method of Shipment: Plant Staff

Shipment Date / Time: _____

Type of test(s) to be performed: Acute Toxicity / chronic Toxicity
 (Specify organisms): Ceriodaphnia dubia / primephales promelas

PRINT & SIGN NAMES

Relinquished by: (Print) Goddie Woolfolk /Sign [Signature] Date/Time 9-20-13 10:35

Received by: (Print) Mendenhall /Sign [Signature] Date/Time 9-20-13 10:35

Relinquished by: (Print) _____ /Sign _____ Date/Time _____

Received by: (Print) _____ /Sign _____ Date/Time _____

Relinquished by: (Print) _____ /Sign _____ Date/Time _____

Received by: (Print) _____ /Sign _____ Date/Time _____

EFFLUENT CONDITION UPON ARRIVAL AT LABORATORY

JRA #: 13-14329C Arrival Temperature: 0.4°C Date: 9-20-13 Time: 10:35 Ice Present: (Yes) No
 Sample Volume: 250ml Color: Light Yellow Odor: Some Solids: Some pH: 6.40 DO (mg/L): 11.3
 Conductivity (µmhos/cm) 188 @ 25.3 °C Salinity (ppt): <1 TRC (mg/L): <0.02
 Method (For TRC): HACH 8167 Analyst: [Signature]

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated industrial wastewater into a water body in Stafford County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2014 to XXX, 2014

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Stafford County Board of Supervisors, PO Box 339, Stafford VA 22555-0339, VA0057487

NAME AND ADDRESS OF FACILITY: Stafford County Abel Lake Water Treatment Plant, 121 Moorewood Ln, Fredericksburg, VA 22406

PROJECT DESCRIPTION: The Stafford County Board of Supervisors has applied for a reissuance of a permit for the public Stafford County Abel Lake Water Treatment Plant. The applicant proposes to release treated industrial wastewaters at a rate of 0.189 million gallons per day into a water body. The facility proposes to release the treated industrial wastewaters in Abel Lake in Stafford County in the Potomac watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Total Suspended Solids, Total Residual Chlorine. The permit requires monitoring for dissolved copper, dissolved iron, dissolved manganese, dissolved nickel and Total Hardness.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Alison Thompson

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov Fax: (703) 583-3821